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ADDRESSES AND ORIGINAL ARTICLES

THE THYROTOXIC HEART

WITH SPECIAL REFERENCE TO "MASKED HYPERTHYROIDISM"*

BY JOHN HAY, M.D. Vict. and Liverp., F.R.C.P. Lond.

CONSULTING HON. PHYSICIAN TO THE ROYAL INFIRMARY, LIVERPOOL; EMERITUS PROFESSOR OF MEDICINE, LIVERPOOL UNIVERSITY

I FEAR that our profession as a whole is not even now sufficiently alive to the presence in their clientele of many patients suffering from thyrotoxicosis, camouflaged as heart disease. It does not appreciate to the full the significance and gravity of this type of toxæmia, nor the necessity for more frequent and earlier surgical intervention.

In 1920 Dr. J. Strickland Goodall [3 4] strongly advocated surgical treatment in thyrotoxicosis because he was convinced that it offered the best chance of permanent success—a view which becomes more and more recognised as the rational method of attack. His vigorous advocacy of subtotal thyroidectomy did much to popularise this method of treatment at a time when it was viewed with suspicion and fear by most British physicians and surgeons.[5] About this period and onwards he worked in collaboration with his friend and colleague, Mr. Lambert Rogers, and several papers were published under their joint names.

It is pleasant to record that in 1924 W. Dameshek,[10] writing in the *Boston Medical and Surgical Journal* on The Heart in Hyperthyroidism, says:

"Even by recent writers, the paramount importance of the cardiac condition in the disease, aside merely from its theoretical interest, has not been at all emphasised. Of all the present writers Goodall alone seems to be the one who has not missed the point (or what I believe to be the point) in regard to the importance of these disturbances."

Historical Survey

Up to 1920 the literature in regard to Graves's disease and toxic adenoma was relatively scanty, and emanated mainly from America, Germany, and France. The symposium on thyroid disease in Berlin in 1906 stirred up interest in this subject with a corresponding increase in the communications to the medical press, and from 1920 on there has been a veritable spate of papers dealing with the problems inherent in thyrotoxicosis and its associated cardiovascular phenomena.

Since 1834 Graves's disease has been recognised as a well-defined clinical entity characterised by exophthalmos, enlarged thyroid with tachycardia and tremor, and its diagnosis presents no difficulty. Later, in 1885, Charcot described the "formes frustes" in which the clinical manifestations were incomplete and associated with cardiac involvement. Towards the end of the last century the close relationship between toxic adenoma and the hyperplastic type of thyroid was beginning to be recognised, and in 1899 Kraus [11] wrote concerning the thyroid heart and its relationship to toxic goitre. From the first the involvement of the cardiovascular system was noted, but it was not until the early years of this century that the inward significance and importance of the effects of thyrotoxicosis on the heart began to be appreciated.

This first phase lasted until the earlier part of this century when a new era in the investigation of thyrotoxicosis began with the more general use in clinical medicine of the electrocardiograph and the sphygmomanometer. The auscultatory method of recording both systolic and diastolic pressure dates from about 1905, and it was in 1909 that the specific nature of auricular fibrillation was demonstrated by Sir Thomas Lewis. About the same time the measurement of the basal metabolic rate began to be utilised. The study of thyrotoxicosis from then became more exact and from 1920 onwards the results are manifest in the increased output of papers.

Even at this period surgery was playing a well-defined part in treatment. Kocher, the Mayos, Halsted, Berry, Dunhill, and Joll had between them reported many hundreds of cases. But the surgeons of those days were working under very great disadvantages in regard to the preparation of patients for operation and post-operative management, and the operative risk was high.

This second phase was characterised by an intensive investigation along the lines above mentioned, and the recognition that there were two clearly defined clinical types of trouble. It was realised that underlying both there was the same element of thyrotoxicosis: (1) the primary, hyperplastic type—diffuse toxic goitre—the more acute, which occurred at an earlier period in life, age 15–35; and (2) the secondary, the toxic adenoma—nodular toxic goitre—the toxic process persisting for many years with exacerbations and intervening periods of relative improvement, continuing into the later decades of life—age 30–70. It was generally accepted, for all practical purposes, that thyrotoxicosis was the essential feature in each, and that the difference lay in the variations in intensity, in the duration of the thyrotoxicosis, and in the physique and psyche of the patient.

Characteristic Features

Now it is obvious that when we are dealing with a toxæmia which persists from the fourth to the seventh decade we have, complicating the picture, those changes—cardiovascular in origin—which are associated with this age-period, with its liability to hyperpiesis and coronary disease: and it is this factor more than any other which complicates the clinical manifestations of nodular toxic goitre.

Based on a critical analysis of the large mass of clinical material, certain features are now recognised as characteristic of thyrotoxicosis. There is a definite increase in the basal metabolism; the systolic blood pressure tends to rise and as the rise in the diastolic pressure is either negligible or slight, the result is an increase in the pulse pressure; and, lastly, in addition to tachycardia there is a remarkable liability to cardiac arrhythmias, more particularly that of auricular fibrillation, either paroxysmal or persistent. In fact, Jones [12] goes so far as to state that in his experience auricular fibrillation, paroxysmal or persistent, is more often seen in thyrotoxicosis than in any other form of heart disease.

It is interesting to note the manner in which our point of view has altered in regard to patients suffering from thyrotoxicosis. Time was, when faced with a patient suffering from toxic goitre, one was interested in the tachycardia and the cardiac

* The first Strickland Goodall memorial lecture, delivered on Oct. 14th at the Society of Apothecaries of London. Prof. Hay introduced the lecture with a tribute to the professional life and personal character of the late Dr. J. Strickland Goodall, and described the important part played by him in the advancement of cardiology.

arrhythmia as a kind of side issue, an academic interest tempered by the knowledge that most probably both would prove refractory to treatment. Now it is an entirely different story. The presence of tachycardia and fibrillation are valued as the key to the solution of a puzzling syndrome and with the unmasking of the thyrotoxicosis pessimism is replaced by hope. For, once having suspected or recognised the possibility of thyrotoxicosis, a careful scrutiny of the patient and a more detailed cross-examination reveal just those deviations from the normal which are characteristic and of diagnostic value.

As an example of this, I saw the other day a patient of 72 on account of the condition of his heart. He was a thin, active man who consulted his doctor three weeks earlier complaining of not feeling up to the mark and of being a little short of breath. His doctor found that he was suffering from an attack of auricular fibrillation; the fibrillation lasted for three days but, although the rhythm returned to normal, the ventricular rate remained at about 100 per minute and the patient had still a definite tendency to shortness of breath on effort. He had also suffered recently from a little transient diarrhœa.

On examination there was nothing abnormal to be made out in the heart, no valvular disease, no apparent enlargement; the radial pulse had a collapsing quality, the blood pressure was 150/60 mm. Hg, skin unduly warm, flushed, and moist; there was a fine tremor of the hands, and on cross-examination both the patient and his wife admitted that for the last month they had noticed a staring quality about his eyes. There was no evidence whatever of any abnormality about the thyroid gland, and there was no exophthalmos.

Here, I think there can be no doubt that we were dealing with a condition of thyrotoxicosis in a patient who presented himself on account of cardiac disability. It was the occurrence of paroxysmal fibrillation which aroused suspicion, coupled with the persistent tachycardia and a raised pulse pressure. Careful examination and cross-examination proved the correctness of the surmise.

Classification

The varying manifestations of thyrotoxicosis permit of certain groupings of the clinical material which may be presented as follows:—

Diffuse toxic goitre.—Graves's disease, characterised by enlargement of the thyroid, undoubted exophthalmos, tachycardia, tremor, loss of weight, a tendency to gastro-intestinal crises, and a high basal metabolism. In this group the onset is usually sudden and occurs from the age of 15 to 25. Females are much more frequently affected than males. The diagnosis is obvious and difficulty only arises when the thyrotoxicosis is slight and the clinical picture incomplete.

Nodular toxic goitre.—Toxic adenoma, described by Plummer in 1912,[13] characterised by chronicity with irregular enlargement of the thyroid, not always demonstrable, tremor, tachycardia, and loss of weight. Exophthalmos is much less common and usually slight. Here again females predominate. The onset is gradual and insidious and there is a long history of goitre. The patients in this group are found in the middle decades of life, although they have sometimes been goitre-bearers for many years, and they show a well-marked tendency to develop cardiovascular abnormalities such as hyperpiesis and auricular fibrillation with resultant congestive failure.

It is in this group that errors in diagnosis are most likely to occur: firstly, because the thyroid may be so slightly altered as to escape notice; and secondly, because the long-continued thyrotoxicosis, although not of a high grade, is prone to produce myocardial and vascular changes, and the clinical manifestations of cardiovascular disease dominate the picture to such an extent that the essential lesion, the causal toxæmia, is overlooked. The tragedy is that failure to recognise the underlying toxicosis may cost the patient her life.

It is in patients suffering from nodular toxic goitre that masked hyperthyroidism is most likely to occur. The chronicity of the low-grade toxæmia and the fact that it persists into and beyond middle age, the age for degenerative changes in the cardiovascular system, offer just the opportunity for the evolution of a baffling combination of symptoms.

Masked hyperthyroidism is a term which signifies that the usual signs and symptoms of hyperthyroidism are obscured by the more obvious indications of some other clinical entity. In such patients the symptoms of hyperthyroidism retire into the background and the liability to error is much greater when exophthalmos and goitre, two of the classical signs of hyperthyroidism, are absent.

The Masked Form

If we are to recognise the presence of a low-grade thyrotoxicosis there are certain indications to which we must be alive. First and foremost come deviations from the normal in the heart. Auricular fibrillation, either paroxysmal or persistent, especially in a patient under fifty should arouse suspicion, similarly auricular flutter—though this is more rare. In fact, Wishart[14] states that auricular fibrillation or flutter in patients with a normal basal metabolic rate, but who subsequently develop Graves's disease, may be the earliest detectable sign of thyrotoxicosis. Then there is usually a persistent moderate tachycardia with an increase of pulse pressure and a pulse which is "collapsing." Occasionally one finds a "suddenness" of the apex-beat and a snappiness of the mitral first sound which are suggestive; and Parkinson and Cookson[15] have shown that there is a characteristic straightening of the left border of the cardiac shadow in the radiogram. Further indications are palpitation, either of brief duration or constant, and extrasystoles, more significant if associated with tachycardia. The heightened metabolism will be suggested by loss of weight for which there is no adequate explanation. This may occur in spite of a good appetite which is amply satisfied, and it persists in spite of rest in bed.

The "eiderdown test," an early sign of increased metabolic rate, is sometimes obtained by tactful inquiries as to whether connubial bliss has been disturbed by differences of opinion in regard to the eiderdown. The patient, distressed by the heat of the extra covering and, regardless of the comfort and wishes of her partner, throws it over to his side of the bed: the result is a mild altercation. Whether this is in truth the acid test, it is at any rate of value, and it is amusing to watch the embarrassment on the faces of the patient and her husband when one first puts the question: "Can you tell me when you first began to quarrel about the eiderdown?" Other features are a warm moist skin, sometimes flushed and with a tendency towards a salmon hue.

Though there may be no exophthalmos there is often a slightly staring quality, or a peculiar brightness which is most suggestive. Such patients are usually restless, eager, alert, and difficult, with a leaning towards emotional instability. There is a temperamental change characterised by irritability and there are frequent periods of depression. A fine tremor is characteristic and one may discover a transient glycosuria.

Although circulatory disorders are the commonest masking factors, other conditions are sometimes

present which by their prominence obscure the hyperthyroidism. Transient glycosuria has already been mentioned; on occasion this is so pronounced that the physician is satisfied with a diagnosis of diabetes, being partly misled by the steady loss of weight. There is no doubt, however, that in many patients in whom the glycosuria has been severe and controlled with difficulty by careful dieting and the administration of insulin, operation has been of the greatest service.[16]

A group of patients has been described by Freund and Cooksey[17] comprised of elderly individuals whose chief complaints were abdominal and gastro-intestinal. The outstanding symptoms were nausea, vomiting, loss of appetite, abdominal pain, diarrhœa for which there was no apparent reason, difficulty in swallowing with regurgitation of food, weakness, and loss of weight even to emaciation. There was a moderate increase in the heart rate. Nervousness, tremor, although present in varying degrees, were not initial complaints.

Clinical Types

It is well recognised that the clinical manifestations of hyperthyroidism are many and diverse; comparable to the protean symptomatology of *hypo*thyroidism, and a knowledge of their character is the first step towards their recognition, for as Charcot said "We see what we know." Patients suffering from masked thyrotoxicosis have been divided into groups by various writers and it simplifies matters to present them in this manner, although it hardly needs emphasising that there is no hard and fast dividing line.

The largest and most important group is undoubtedly that in which the thyrotoxicosis is masked as "heart disease."

In 1924 Levine and Sturgis[18] reported 5 patients in whom the cardiac symptoms had been present for two years, and the conditions had been regarded as solely due to cardiac disturbance. Later, in 1929, Levine and Walker[19] published further observations on the same type of patient, and included in this series of 11 patients 3 suffering from angina pectoris, a form of masked thyrotoxicosis to which I shall refer later. These patients prove resistant to treatment: their response to digitalis is unsatisfactory, and in spite of every care they tend to become progressively worse.

Careful reconsideration of the clinical findings unmask some of the features of mild thyrotoxicosis which I have enumerated. The presence of fibrillation is in itself suggestive and the correctness of the revised diagnosis is verified by the immediate and sometimes dramatic response to correction of the thyrotoxicosis. Further proof is obtained by histological examination of the mischievous thyroid. The patients described by Levine were of the alert, restless, nervous type, and showed a tendency to loss of weight.

There is another group similar to the above in which the restlessness, emotional instability, and irritable mentality are absent and are replaced by a peculiar condition of apathy.

This was described by Hamburger and Lev in 1930.[20] Their patients, although suffering from hyperthyroidism, presented an unusual apathetic listless appearance and what the authors describe as a "mask-like" face. There was an absence of tachycardia. The hyperthyroidism was indicated by a raised metabolic rate, general weakness, an undue liability to fatigue, redness or pigmentation of the skin, and an unexplained loss of weight. In only one patient a slightly staring expression or startled look was noted. In each instance the patient had been under treatment for heart disease and showed definite improvement when treated as a case of thyrotoxicosis.

Thyrotoxic hypertension.—More recently Parkinson and Hoyle[21] have drawn our attention to a clinical group of "masked hyperthyroidism" for which they have suggested the term "thyrotoxic hypertension," a term applicable to a group of patients, usually women of mature years. Moderate tachycardia is present, both the blood pressure and the pulse pressure are high, and there is a marked liability to auricular fibrillation. As they point out "masked hyperthyroidism" has already been related to myocardial disease. It is now seen to figure in relation to hypertension. They hold that the combination of hyperpiesis and long-standing thyrotoxicosis is more than accidental and that the recognition of this group is important. Its importance lies in the fact that failure to recognise the existence of the underlying chronic thyrotoxicosis leads to errors in diagnosis, stultifies the prognosis, and sidetracks essential treatment. Here, as in the other groups, the advent of auricular fibrillation is of diagnostic significance and, as Parkinson states, "Whenever auricular fibrillation occurs in a patient with hypertension, goitre is to be suspected as a likely cause." If this is borne in mind there will be fewer errors in diagnosis.

"*Thyrotoxic angina.*"—There is yet another group of masked hyperthyroidism—namely, that in which angina is the dominant symptom.

In 1928 Lev and Hamburger[22] reported favourable results following thyroidectomy in 5 cases of angina. In their patients the thyrotoxicosis was not masked, but they served as a demonstration of the wisdom of removing the whip from an already damaged heart. The following year Levine and Walker[19] described the outcome of operation in patients with anginal symptoms in whom the thyrotoxicosis, though present, was obscured. Hamburger and Lev[23] in 1930 referred to this combination and published a similar case. Towers[24] in 1933 in his paper on "masked hyperthyroidism as a cause of heart disease" noted the presence of anginal pain in one-third of his 15 cases, and in the same year Rosenblum and Levine[25] published the results of subtotal thyroidectomy in 69 patients, 9 of whom were anginal, 7 being typical anginas and 2 suffering from coronary thrombosis.

This brief reference to some of the published results will suffice to demonstrate that thyrotoxicosis by its persistent demand can unmask a potential or latent angina. There is no rest night or day for the heart overdriven by an overactive thyroid.

Illustrative Case

In dealing with patients to be found in one or other of the groups such as we have been discussing, in whom the hyperthyroidism is masked by varied, dominant, and misleading symptoms, our first duty is to discover the thyrotoxicosis, for this is the nigger in the wood pile and he must be exorcised. When browsing through the voluminous literature dealing with thyrotoxicosis, I have been made increasingly aware of instances in my own experience where I have failed in the complete diagnosis, not having been sufficiently alive to the significance of one or other of the manifestations of low-grade thyrotoxicosis. This was brought home to me recently and I quote it as a sample of the incomplete diagnosis.

Four years ago I was asked to see a woman of 71. (Some months before I had attended her husband in a fatal attack of coronary thrombosis.) She was thin and active, and complained of attacks of palpitation and a feeling of weakness. Two months previously she had suffered from a short paroxysm of auricular fibrillation. Her urine contained sugar—poorly controlled by dieting.

On examination the cardiac rhythm was normal, the heart moderately enlarged, there was no valvular disease,

and blood pressure was 180/80 mm. Hg, heart rate 85 to 90 per minute. The radial arteries showed moderated arterio-sclerosis.

I classified her as a hyperpietic glycosuric with added paroxysmal auricular fibrillation. She did fairly well under careful management. I saw her again in 1934. The paroxysms of auricular fibrillation were becoming more frequent though not distressing. Blood pressure 160/60 mm. Hg, heart rate 80, fundamental rhythm normal. Latterly the fibrillation has been increasingly troublesome, the attacks more prolonged, although the ventricular rate is not rapid when fibrillation is present.

Her condition on Oct. 13th, 1936, was as follows: Weight 8 st. 6 lb. (she had lost over half a stone during the year). Auricular fibrillation present with a ventricular rate of 80–90 per minute, only partially controlled with digitalis. Blood pressure for the stronger beats 170/80 mm. Hg, skin pale, no eye changes, no tremor. On carefully palpating the neck I was able to recognise very slight irregular enlargement of the thyroid, and then the patient volunteered the statement that when she lived in Staffordshire she was afflicted with a goitre but this had disappeared on coming to Liverpool 20 years ago.

On reviewing the clinical data, the interpretation with which I think you will agree is as follows. This patient many years ago was a symptomless goitre-bearer. Change of residence caused the goitre to disappear, though in all probability there was a persistent low-grade thyrotoxicosis. Her blood pressure rose and glycosuria developed. In 1932 her husband died from coronary thrombosis. This psychic trauma excited the grumbling thyroid and precipitated toxic fibrillation. We now find a characteristic grouping of symptoms in a spare woman, past middle age—hyperpiesis, glycosuria, paroxysmal fibrillation, and a high pulse pressure, with a slight increase in heart rate, nothing abnormal in the appearance, eyes normal, skin normal, no tremor, and a thyroid only recognised as abnormal with difficulty. It is not unreasonable to assume that a thyroidectomy 20 years ago would have mitigated, if it had not prevented, the disasters of the last four years.

Treatment

It is not my intention to discuss treatment at any length and I will content myself with a short statement. The majority of cases of masked hyperthyroidism are to be found in patients afflicted by nodular toxic goitre and it is to this group that my remarks apply.

Reviewing the life-history of such patients one recognises the serious effects ensuing from chronic low-grade thyrotoxicosis, for this is a disease which, if allowed to run its course, eventually proves disastrous. The effects of this toxæmia are varied but it is the cardiovascular system which bears the brunt. In any but the mildest cases operation is the only safe procedure. Danger lies not in operation but in delay. As Dunhill [16] reminds us, one of the most pressing needs is to detect quickly when a patient ceases to hold and first begins to "slip," for that is the time to operate. It is clearly culpable when dealing with a disease of this nature to persist in medicinal and general treatment after it is recognised that the patient is losing ground.

It is unfortunately only too true, however, that many patients suffering from masked hyperthyroidism do not come under observation until the heart is already damaged. In such, auricular fibrillation, congestive failure, hyperpiesis, and angina pectoris are *not* contra-indications but rather an urgent call for operation. Cardiac enlargement may be placed in the same category.[15]

Operation is undertaken to cure the congestive failure and to remove the liability to angina by excising the poison factory and thus arresting the downward progress of cardiovascular disease. And it is remarkable how well apparently hopeless cases of congestive failure stand up to operation. Thyroidectomy must not be expected to alter the character of the myocardium nor restore a normal calibre to a diseased coronary, but it can and does remove the persistent strain on the heart due to the heightened metabolism which is responsible for the cardiac failure. The operative risk in skilled hands is now small. Success depends not only on the special skill of the surgeon but also on close and sympathetic coöperation between the surgeon and the physician. As an example we have the brilliant results from the team-work of Fraser and Dunhill,[16] and for a careful and considered discussion of the conditions determining operation I would refer you to their lectures published in St. Bartholomew's Reports.

In the presence of a nodular goitre when all evidence of thyrotoxicosis is absent, doubts may arise as to the wisdom of operation. Thyroidectomy is then prophylactic in nature, its object being to prevent the development of heart disease, and it can be carried out with a minimum of risk. But if a goitre-bearer at any time manifests even slight symptoms of thyrotoxicosis operation should be seriously considered.

A "grumbling goitre" is as dangerous, if not more dangerous, than a grumbling appendix. The public has been educated to part with an appendix with equanimity tinged at times with a soupçon of pride. Is it too much to hope that some such change of attitude may take place in regard to thyrotoxicosis?

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BOLINGBROKE HOSPITAL, LONDON—On Dec. 2nd the Duchess of Gloucester opened the new extension to this hospital which was founded in 1880. The extension has cost £70,000, and provides accommodation for another 14 beds.

CLINICAL AND LABORATORY INVESTIGATION ON VOLUNTEERS INFECTED WITH PFEIFFER'S BACILLUS

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THE observations were carried out on eighty volunteers varying from 17 to 42 years of age, who had no noticeable affections of the heart, the lungs, or other viscera, and in whom the mucosa of the air-passages was in a normal condition.

The total number of experiments was 21, the number of people involved in one experiment varying from three to twelve. With a view to obtaining more manifest reactions to inoculation with Pfeiffer's bacillus, we subjected some of the volunteers to the procedure two days in succession. Thus on the whole we administered 168 inhalations, out of which number 110 were given with a living culture of Pfeiffer's bacillus, 29 with a culture of the same microbe previously killed, 14 with the throat washings containing Pfeiffer's bacillus and obtained from patients suffering from influenza, and 15 with control materials (such as horse serum, *Bacillus pseudodiphtheriæ*, *Micrococcus catarrhalis*, and typhoid vaccine).

Technique of inoculation.—The face of the volunteer was covered with a mask used for ether-chloroform anæsthesia. The outlet pipe of a glass atomiser containing 10–12 c.cm. of a living or a dead culture of Pfeiffer's bacillus or other microbes was inserted into a small aperture in the centre of the mask. An electric air-pump supplying 50 litres of air per minute was used to pass a current of air through the atomiser where it absorbed the atomised solution which was then carried in the form of minute drops into a glass reservoir attached to the atomiser. The smallest particles of the solution escaped the reservoir in the form of nebulous dust, penetrating inside the mask, and were inhaled into the respiratory tract of the subject under experiment. The inhalation lasted for 15 minutes, during which period from 5 to 10 by 10^8 cells of the culture were found to have been introduced into the respiratory tract of the volunteer.

Characteristic features of Pfeiffer's bacillus used for infection.—The first experiments were carried out with a virulent culture of Pfeiffer's bacillus which had been previously passed 32 times through the abdominal cavity of white mice. A dose of 0·5 c.cm. of a 20-hour bouillon culture introduced intraperitoneally was found to kill the mice within 1 or 2 days. A dose of 0·1 c.cm. caused death in some of the inoculated mice.

Later our desire to produce greater responsive reactions led us to continue our work, using 4–5 cultures of Pfeiffer's bacillus freshly obtained from patients with influenza.

FATE OF PFEIFFER'S BACILLUS INTRODUCED INTO THE RESPIRATORY TRACT: ITS EFFECT ON PNEUMOCOCCI AND HÆMOLYTIC STREPTOCOCCI IN THE THROAT

To determine the duration and the stability of the fixation of Pfeiffer's bacillus on the mucosa of the respiratory tract of our volunteers, as well as the effect of infection on the content of hæmolytic streptococcus and of pneumococcus in the same region, all the volunteers were repeatedly examined both before and after the culture was inoculated and a quantitative check-up was made of three organisms: Pfeiffer's bacillus, the hæmolytic streptococcus, and the pneumococcus. The last dilution of the original material that still showed growth of Pfeiffer's bacillus and the streptococcus on plates or still caused mice to die of pneumococcus sepsis determined the quantity of causal organisms present on the mucosa of the respiratory tract.

The results of repeated bacteriological examinations, varying in number from 6 to 12 for each individual case and carried out on forty-two subjects, inoculated with the living culture of the microbe, have served to show that Pfeiffer's bacillus on being introduced into the respiratory tract always thrives there, being present in high concentrations in the mucosa of the nose and the throat within the first 5–10 days following inoculation.

The material collected by means of tampons not infrequently revealed the presence of hundreds of thousands and even millions of living Pfeiffer's bacilli several days after the inhalation. The period of their fixation did not as a rule exceed 10 days. By that time the quantitative indices were found to show a rapid fall, returning to the level observed in our volunteers previous to their inoculation.

As regards the behaviour of the hæmolytic streptococcus and of the pneumococcus in individuals infected with a living culture of Pfeiffer's bacillus, it was found that the pathological reactions and inflammatory phenomena developing on the mucosa of the respiratory passages had no noticeable effect on the content of these micro-organisms in this region. Thus, before inhalation the hæmolytic streptococcus was found to be present in forty-two people seven times; following inhalation (on the 2nd–4th day) it was found to occur nine times, the quantitative indices remaining on the level of the original figures.

Pneumococci of Type IV. were discovered in the same group of persons twenty-nine times previous to inhalation and thirty-two times subsequent to it, and could be isolated both before and after infection in dilutions of the corresponding washings which did not exceed 1 in 10 and 1 in 100.

These data point to the fact that the experimental infectious process that is caused by inoculating people with Pfeiffer's bacillus is not followed by an activation of the main causal organisms producing the secondary complications that usually accompany influenza. Therefore, the symptoms developed by persons who had been subjected to infection can reasonably be attributed to the toxic products of Pfeiffer's bacillus but not to the secondary processes of a streptococcal or pneumococcal nature.

CHANGES IN THE IMMUNOLOGICAL PROPERTIES OF THE BLOOD OF INFECTED VOLUNTEERS

Inoculation with Pfeiffer's bacillus by means of inhalation, particularly if it is repeated, always leads to a distinct rise in the concentration of specific agglutinins and complement-fixing substances in infected individuals. The agglutination test was found to be positive in 6–10 days after the first inhalation in most of the volunteers in dilutions of the serum of 1 in 40 to 1 in 80, being still more manifest in a number of cases (positive reactions with a serum in a 1 in 320 dilution).

The complement-fixation reaction proved to be even more sensitive than the agglutination test: all the volunteers who were subjected to infection yielded positive results as early as on the 5th–6th day after inoculation, the specific changes being very great in a number of the cases.

SYMPTOMS DEVELOPING AFTER INTRODUCTION OF PFEIFFER'S BACILLUS INTO THE RESPIRATORY TRACT

For the purpose of estimating the clinical symptoms, both the subjective complaints of the patients and

the objective changes affecting the respiratory organs, the temperature reaction, the pulse, the viscera, and the blood (counting of leucocytes, blood formula, and erythrocyte sedimentation test) were very carefully registered.

All the 110 volunteers infected by means of inhalation of the living cultures of Pfeiffer's bacillus developed in 4–6 hours following inoculation clinical symptoms that indicated that the patient was in a condition of an infectious intoxication of a greater or lesser severity, lasting for 1 or 2 days. Clinically the experimental infection was mainly characterised by:

(1) Inflammatory œdema of the mucosa of the air-passages and hyperæmia of the nasal conchas, dryness of the nasal mucosa with a subsequent mucous discharge, slight cold in the head, conjunctivitis, hyperæmia of the pharyngeal mucosa, swelling and reddening of the tonsils, and in some cases swelling of submaxillary lymphatic glands. No regular sequence of changes affecting the upper respiratory tract was observed, and in the vast majority of the cases the reaction lasted but a short time (1–2 days, with a maximum of 4 or 5 days). Occasionally pathological symptoms were also observed to develop in the larynx, consisting mainly in hyperæmia of the vocal cords, and there was sometimes a tendency towards nasal hæmorrhage. No reaction on the part of the nasal cavities or the ear was ever noted.

In response to the introduction of dead cultures of Pfeiffer's bacillus the local symptoms, if any, were quite insignificant.

(2) The general phenomena that developed after the infection with a living culture varied considerably in intensity. In cases when the reaction was particularly strong the symptoms were as follows: 4–6 hours after the inhalation the patient had a rigor, the temperature rose rapidly to 38–39°, and he suffered from a severe headache, weakness, cough, pain in the joints, and in some cases herpes labialis. Auscultation of the lungs revealed dry and occasionally moist râles not accompanied by any percussion changes. In cases with a very marked reaction there was an occasional dullness of heart tones and a systolic murmur at the apex.

It was characteristic of all these phenomena that they were extremely unstable and lasted but for a short time. In the large majority of the volunteers we observed the temperature was again normal in 24–36 hours following infection, showing but in a few cases subfebrile rises within the next few days. A cough and a cold in the head as well as complaints of weakness lasted a little longer.

The introduction of dead cultures of Pfeiffer's bacillus produced a reaction which only slightly resembled the infection resulting from the inhalation of its living culture.

In experiments in which inhalations of horse serum and of certain micro-organisms of either a toxic or a non-toxic nature were given (such as typhoid vaccine, living cultures of *M. catarrhalis* and of *B. pseudodiphtheriæ*) in concentrations of 10,000 million to 1 c.cm., the results observed were as follows: the introduction of horse serum (3 cases) and that of the *B. pseudodiphtheriæ* (3 cases) failed to produce any responsive reaction.

Inhalations of the typhoid vaccine (6 cases) were followed by an unstable temperature reaction—which was as high as 38° C. (100·4° F.) in one of the cases—lasting for about 12–18 hours, mild subjective phenomena (slight chill, weakness, and headache). No local phenomena on the mucosa of the respiratory passages were observed. Inhalations of a living culture of the *M. catarrhalis* produced in 2 cases out of 3 very slight general and local symptoms.

It should therefore be noted that the clinical reactions in response to the introduction of a living culture of Pfeiffer's bacillus were much greater than those produced by either the typhoid vaccine or the *M. catarrhalis*.

The changes in the blood picture caused by human experimental infection are of particular interest. It is well known that in epidemic influenza the picture of the blood shows very constant and typical deviations from normal: leucopenia, which is most manifest by the 2nd–5th day; lymphopenia, which first appears on the second day of the disease and gradually disappears by the 4th–5th day; neutropenia, which is most conspicuous on the 4th–5th day of the disease; eosinopenia, lasting throughout the feverish period; and, according to Korovin, monocytosis within the first few days of the disease.

We found that the picture shown by the blood in the experimental infection caused by Pfeiffer's bacillus was the reverse of that observed in epidemic influenza.

All the volunteers who were infected were found to show in the few hours immediately after the inhalation a marked leucocytosis. In the first group, which on the average constituted about 40 per cent. of all the infected volunteers and which showed particularly intense local and general phenomena with a rise of temperature up to 39·5–40·1° (103–104° F.), leucocytosis was as high as 12,000–15,000; in the second group, which made up about 35 per cent. of the total number and in whom the clinical symptoms were of medium severity, leucocytosis varied from 9000 to 12,000; and, lastly, in the third group, constituting about 25 per cent. of the total number, the clinical symptoms were very mild, the temperature did not rise above 37·4° (99·4° F.) and leucocytosis did not exceed 11,000.

There was also observed an increase in both the relative and the absolute quantity of neutrophils, which showed a definite shift to the left in the direction of younger cells, the neutrophil curve reproducing that of the leucocytes.

The absolute quantity of lymphocytes was above the normal level in every one of the cases. No eosinopenia was observed. The reaction of erythrocyte sedimentation, which is usually somewhat delayed in cases affected with epidemic influenza, was found to be greatly accelerated in our infected volunteers.

This very conspicuous discord between the blood picture observed in epidemic influenza on the one hand and the picture after the inhalation of a living culture of Pfeiffer's bacillus on the other can be regarded as a weighty proof against the two affections being identical.

Thus there is every reason to assume that the experimental affections resulting from the introduction of Pfeiffer's bacillus into men resemble genuine influenza only in some of their symptoms, such as the sudden onset of the disease with rigor and rise of temperature, the catarrhal phenomena affecting the upper respiratory passages, the appearance of herpes in many of the cases, and the presence of certain symptoms of influenzal intoxication (headache, pains in the joints, &c.). The short duration and the extreme instability of the febrile reaction and of all the other local and general symptoms, as well as the absence of any complications in all the forty-three volunteers who were infected with a living culture and the peculiar nature of the changes occurring in the blood, serve to prove that the symptom complex observed does not fit in with the typical clinical course run by epidemic influenza. Another of the main symptoms of epidemic influenza—i.e., its extreme infectivity—was not observed in these cases of artificial Pfeiffer's infection. The medical personnel

who came into close contact with the infected volunteers did not contract the disease, and infectivity could not be demonstrated in special experiments in which particularly favourable conditions were created for contact infection.

SUMMARY

Our investigation shows that Pfeiffer's bacillus is capable of producing, under conditions of experimental infection, an infective process of intoxication with a number of manifestations that resemble certain symptoms of influenza. It provides evidence, however, that the illness produced by introducing virulent cultures of Pfeiffer's bacillus into a healthy person is not genuine epidemic influenza.

ON THE ÆTIOLOGY OF THE 1936 INFLUENZA EPIDEMIC IN LENINGRAD

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THE violent outbreak of epidemic influenza that spread throughout the Soviet Union in February and March, 1936, showed a very high morbidity in Leningrad, where there were approximately 500,000 cases.

Making use of the method worked out by Smith, Andrewes, and Laidlaw (1933), we studied the throat washings obtained from patients affected with influenza in this epidemic with a view to detecting the presence of a virus pathogenic for ferrets.

Two ferrets were given intranasally under ether anæsthesia within a period of two days—to increase the effect of the virus—1 c.cm. of unfiltered washings from 5–12 patients suffering from a fresh infection of influenza (on the first or second day of the disease). One of the ferrets developed typical morbid symptoms on the day after the second inoculation. When the disease had reached its maximum height we obtained a throat washing and some nasal mucus from the infected ferret and inoculated it intranasally into five young mice. This was done under ether anæsthesia. Mice were chosen for the experiment owing to the shortage of ferrets at our disposal at the time of the epidemic. Six days after the inoculation all the mice were killed. The lungs of two of the mice revealed small broncho-pneumonic foci, about 1–2 mm. in size, which a bacteriological examination proved to be sterile. The virulence of the virus was found to increase with great rapidity so that by the fifth passage all the mice which were given a 5 per cent. lung emulsion from the previous passage died on the 4th–7th day following inoculation, showing symptoms of severe pneumonia and complete hepatisation of the lung tissue. Bacteriological tests proved these lungs to be sterile in most cases.

This latter strain possessing a high degree of virulence was then used in a number of experiments with the object of comparing it with the British virus.

Expt. 1.—Groups of mice were subjected to inoculation with our strain in combination with: (*a*) various dilutions of a specific immune horse serum which had been sent us from London; (*b*) normal horse serum; (*c*) normal saline solution. All the mice of Series *a* survived, while the control mice of Series *b* and *c* died.

Expt. 2.—Sixteen mice were given two daily subcutaneous inoculations of the London virus (WS) for 20 days. Then eight of the mice were inoculated intranasally with the same virus and the other eight with our strain. Both the groups survived while the control groups of normal mice died. The WS virus was instilled in a dilution of 1 : 1000 (500–1000 lethal doses), our virus in a dilution of 1 : 100 (10–50 lethal doses).

Expt. 3.—The London immune serum in a dilution of 1 : 10 was mixed with a 10 per cent. emulsion of our strain. The mixture was stood in a thermostat for 2 hours and in an ice cellar for 20 hours, and then centrifuged. The serum obtained was heated at 55° C. for 30 minutes (to destroy our strain), combined with the WS virus in a 1 in 1000 dilution, and then injected into mice. All the mice died on the 4th or 5th day.

Thus the lung emulsion of a mouse that had died after an intranasal inoculation with our strain had fully adsorbed the specifically virulicidal antibodies of the London serum.

The above experiments served to show that the virus we had obtained in the influenza epidemic of 1936 was identical with that of Smith, Andrewes, and Laidlaw. Similar results have been obtained by C. H. Andrewes with our virus (personal information).

Our success in isolating the virus as early as after the first passage in ferrets may be accounted for:

(i) By the high virulence of the causal organism in the Leningrad epidemic and by our using a more intense method of inoculation—i.e., a double inoculation of ferrets under ether anæsthesia instead of a single intranasal instillation, as had been practised by the English investigators.

(ii) By our inoculating ferrets with a non-filtered washing containing a considerably larger quantity of the virus than that present in filtrates passed through candles.

(iii) By a further continuous passing of the virus through mice, which greatly increased its initial rather low virulence.

A further study of the isolated strain has served to show:

(1) A gradual increase of virulence as a result of passages through white mice. Titration of virulence after the fourteenth passage resulted in the death of mice if they were inoculated intranasally under general anæsthesia with the lung emulsion in a dilution of 1 in 10,000 and occasionally in one of 1 in 100,000. The corresponding data obtained in our laboratory for the WS virus (London) were:

Dos. certe let	1 in 100,000
Dos. non certe let	1 „ 1,000,000

and for the Francis virus (America):

"Porto Rico"	1 in 1000
"Philadelphia"	1 „ 100

(cf. Francis and Magill, 1935.)

Thus the Leningrad strain considerably exceeded in virulence the Francis strain (America) and was somewhat less virulent than that of the English investigators.

(2) Complete neutralisation of our virus by the sera obtained from influenza convalescents in the Leningrad epidemic.

(3) The development of a typical temperature reaction and symptoms of catarrh of the respiratory tract of a fresh ferret after intranasal inoculation with the Leningrad strain. In 10–15 days time such a ferret was found to be immune to the English virus (WS).

(4) The reproduction of the main clinical symptoms of influenza in persons infected through inhalations of a minutely atomised emulsion of our virus; these inhalations were administered on three consecutive

days and lasted 30 minutes each. Five volunteers who had not had influenza were infected by the inhalation method and showed a number of reactions characteristic of influenza (a rise of temperature up to 38·5° C. lasting for 2 or 3 days, symptoms of catarrh of the upper respiratory tract, a slight cold in the head, headaches mainly located in the region of the frontal sinuses, and distinct leucopenia and an increasing quantity of specifically virulicidal substances in the blood). The experiments, which are being carried out on a fairly large number of volunteers, will be discussed in greater detail in a special paper.

CONTENT OF VIRULICIDAL SUBSTANCES IN THE SERUM OF INFLUENZA PATIENTS ON DIFFERENT DAYS OF THE DISEASE

The rôle of the filtrable virus in the ætiology of the last epidemic outbreak in the U.S.S.R. has been indirectly confirmed by us through our studies of the changes in the specific virulicidal substances contained in the serum of patients who have suffered from either non-complicated influenza or one complicated with pneumonia.

The method of quantitative titration of virulicidal substances was as follows:—

0·2 c.cm. of sera in dilutions of 1 in 5, 1 in 25, 1 in 125, and 1 in 500 were mixed with equal quantities of a fresh emulsion of the WS virus in a dilution of 1 in 125. The final dilution of the serum was 1 in 10, 1 in 50, 1 in 250, and 1 in 1000, while the final dilution of the virus was 1 in 250—i.e., it contained about 1000 doses lethal to a mouse. Following a contact between the serum and the virus which lasted for about 20–30 minutes, each dilution of the mixture was inoculated intranasally, under ether anæsthesia, into three young mice. All the mice which died within 5–10 days following inoculation were examined, the intensity of the pulmonary infection was noted, and in case of complete or markedly manifest hepatisation of the lung tissue a bacteriological examination of the blood and the lungs was made. The dead mice either failed to show any micro-organisms in the blood or the lungs, or contained but a scant number.

The observations were first carried out on fourteen cases of non-complicated influenza. The serum was taken on the first or second day of the disease, and a second time after all symptoms had disappeared (on the 10th–12th day following the onset of the disease and in some cases on the 30th–40th day as well). The results of the investigation are shown in Fig. 1. The content of virulicidal substances in each serum is shown in the form of a column made up of 12 squares which are divided into four groups, according to the dilution of the serum. Each square corresponds to one mouse and is either black, which means that the mouse died, or white—i.e., the mouse survived.

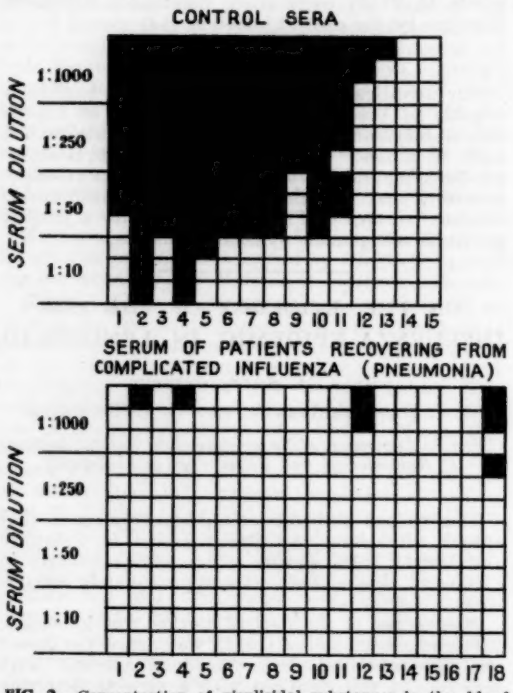

FIG. 2.—Concentration of virulicidal substances in the blood of 15 healthy persons and of 18 patients recovering from epidemic influenza with complications. As in Fig. 1 each black square indicates the death of a mouse, and a white square its survival, after injection of equal quantities of serum (variously diluted) and virus.

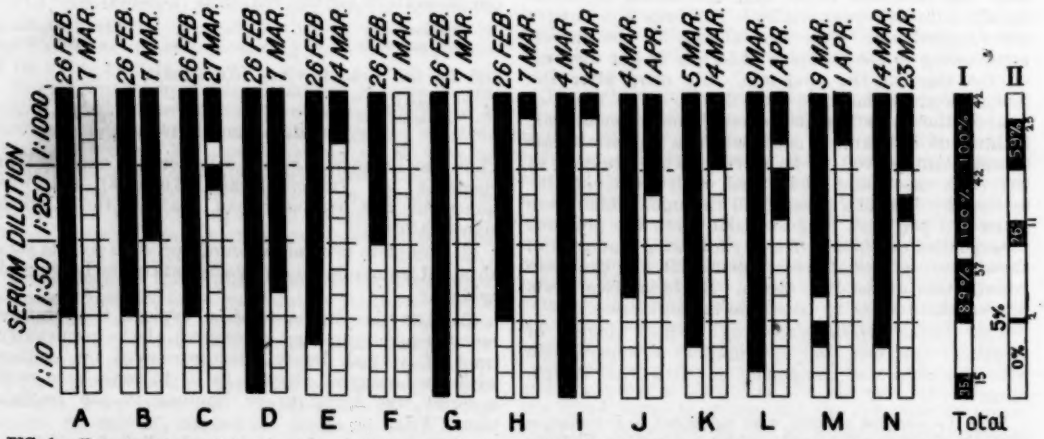

FIG. 1.—Experiments to determine the virulicidal properties of the blood in 14 cases of epidemic influenza (A–N). The serum in each case was taken at the beginning of the illness and again after symptoms had disappeared. After dilution as shown (1 in 10, 1 in 50, 1 in 250, and 1 in 1000) it was added to equal parts (about 1000 lethal doses) of WS virus, and injected into three mice. Each black rectangle represents the death of a mouse, and each white rectangle its survival. Columns I. and II. show the mouse death-rates for the whole series, and the difference between them demonstrates the protective (virulicidal) power of the patients' serum at the end of their illness.

As may be seen from the data presented, the maximum dilution of serum which still neutralised the given dose of the virus at the beginning of the influenzal infection was not over 1 in 10. Dilutions of serum equal to 1 in 50 or more failed to produce the effect, with one exception. The sera obtained from convalescent patients were found to be considerably more active and neutralised without fail the given dose of the virus even in a dilution of 1 in 250, and in a few cases even in a dilution of 1 in 1000. Thus it was found that all the influenza patients whom we observed showed a regular rise in the concentration of virulicidal substances of 25 to 100 times during the period of convalescence.

The next experiment was carried out on the sera of eighteen patients who had recovered from influenza complicated with pneumonia. Fifteen sera obtained from healthy persons on Jan. 22nd, 1936 (20 days before the epidemic broke out in Leningrad), were used as controls. The method of titrating the virulicidal substances was the same as that used in the previous experiment. The results obtained are shown in Fig. 2.

The content of virulicidal substances in the serum of convalescents who had had influenzal pneumonia proved to be on the average still higher than in the non-complicated influenza cases. The vast majority of the sera obtained from pneumonia patients neutralised 1000 minimal lethal doses of virus even in dilutions of 1 in 1000. The composite serum obtained by pooling the eighteen sera was found to neutralise the given dose of the virus in a dilution of 1 in 2500—i.e., it corresponded in potency to the London hyperimmune horse serum.

As compared with the immune sera, the controls appeared to be strikingly poor in these immune elements. Of the fourteen tested, three proved to be inactive even in dilutions of 1 in 10, ten in dilutions of 1 in 50. It is of interest to note that four of the control sera were found to be rich in virulicidal antibodies and neutralised the given dose of the virus even in dilutions of 1 in 250 to 1 in 1000.

It is evident that the virulicidal substances discovered by us in high concentrations in the blood of convalescents should be regarded as specific products of the active immunising effect of the influenza virus.

SUMMARY

A filtrable virus which is pathogenic for ferrets and mice and is identical with the virus discovered by Smith, Andrewes, and Laidlaw has been isolated from the respiratory tracts of patients infected with influenza during the 1936 epidemic in Leningrad.

A regular and marked rise in the concentration of the specific virulicidal elements in the blood of influenza convalescents has been revealed: at the time the disease had reached its climax most of the sera neutralised 1000 lethal doses of the virus only in dilutions which were not over 1 in 10, while the serum of convalescent cases produced the same effect in dilutions of 1 in 250 to 1 in 1000.

An exceptionally high content of virulicidal substances has been observed in the serum of patients convalescent from broncho-pneumonia.

The data obtained confirm the rôle of the filtrable virus as the main and primary causal organism of epidemic influenza.

We wish to express our thanks to C. H. Andrewes, Wilson Smith, P. P. Laidlaw, and Richard Shope for kindly assisting us in many ways.

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THE EFFECT OF BENZEDRINE ON INTELLIGENCE SCORES

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Peoples and Guttmann[1] have reported that Benzedrine (β-phenylisopropylamine) has a stimulating effect on psychological processes, especially in emotionally depressed and retarded patients. It appeared important to us to find out whether the subjective increase in confidence and mental alertness after taking benzedrine was accompanied by a real improvement in general mental efficiency. With this object in view, we decided to ascertain whether benzedrine significantly altered the intelligence test scores of a group of persons previously tested without it, thus giving us an opportunity of investigating the effect of emotional changes on intellectual performance.

It is sometimes held that experimental investigations into the psychological effects of drugs are unsatisfactory owing to the difficulty of assessing the large number of variables present. But the use of intelligence tests on fairly large groups of subjects overcomes this difficulty to some extent. They are among the most exact of the modern psychometric methods and are now well standardised. In addition many of them are issued in "equivalent" forms, so that the same person should obtain the same score whichever form he uses. If large enough groups are employed statistical criteria may be applied in evaluating the results.

Emotional factors are one of the main sources of error in most psychometric observations, but in our experiments they are the subject of the investigation. For while it is extremely unlikely that any drug can have the effect of increasing innate intelligence, yet an individual may sometimes be temperamentally and emotionally unfitted to make as high a score as his abilities warrant. It was thought that the administration of this drug might make a person feel more confident, lose less time in accommodating himself to the task, quicken mental responses, and consequently register a higher score.

DETAILS OF INVESTIGATION

Patients at the Maudsley Hospital who were coöperative enough to undertake the tests and represented a wide variety of personality make-up were used as the material. Details of their mental characteristics were already known and could be correlated later with their reactions to the drug.

Cattell's "intelligence tests" were used. These are supplied in equivalent forms A and B, either of which may be substituted for the other, and are made up in scales of increasing difficulty. A shortened form of Scale 2 was used in these experiments, in which every alternative question was eliminated.

The general procedure was to present one of these forms to the patient on the first day and the equivalent form 24 hours later, after the administration of tablets. For two experimental groups these tablets were benzedrine, for a control group "inert" tablets were used of similar shape and taste. (These were

[1] Peoples, S. A., and Guttmann, E.: THE LANCET, 1936, i., 1107.

substituted without the knowledge of the patients, since the use of benzedrine was known in the hospital and its effect appreciated by some of the patients.) Approximately half of all the patients were given Form A for the first test and Form B for the second, the remainder being given the forms in the reverse order. This was to eliminate the possibility that one form of the test was more difficult than its equivalent, with the result that an increase in score might be solely attributed to this factor. The control group, taking inert tablets, was used to safeguard against the possibility that an increase in score on retesting might be the result of practice, an increased familiarity with the test employed, or to the influence of suggestion in the administration of the drug.

Twenty milligrammes of benzedrine were given to each patient in the two experimental groups, and the tests were carried out on the first group 1½ hours and on the second 2½ hours after its administration. Peoples and Guttmann [1] found that the susceptibility to benzedrine, and the period between its administration and its maximum effect, varied in different individuals and also with the dose given. Many subjects also require a larger dose than 20 mg. to produce the maximum effect, but it was especially desired to avoid overdosage. Probably greater differences in scores would have occurred if it had been possible to make an individual assessment of the correct dosage in each case.

On completion of the experiments changes in the scores were statistically recorded. In addition, results were correlated with the mental symptoms of the patients, and the scores obtained by individual patients examined.

RESULTS

Alteration in average test scores.—It was found that, on retesting, the average score of the control group remained the same, but both groups given benzedrine showed an increase in score of over 8 per cent., representing a rise in the intelligence quotient of approximately 7 points. The results are shown in the following Table.

—	Number of patients.	Mean scores.		Standard error of means.	
		First test.	Retest.	First test.	Retest.
Control ..	19	50·7 pts.	50·9 pts.	2·5	2·9
Expt. 1 ..	26	45·1 „	49·5 „	2·9	2·4
„ 2 ..	22	45·0 „	48·5 „	2·3	2·1

Average score obtained by the general population, 50 pts.[1]
Maximum score obtainable in these tests, 80–81 pts.

It will be seen that the rise in the average score of experimental group 1 is confirmed by a similar rise in score of experimental group 2, and if the scores of the two experimental groups are added together the average increase in the 48 patients is 3·9 points, or 8·7 per cent. (standard error of difference 2·5). This represents statistical odds of seven to one against the increase being due to chance.

The Table shows that the control group was slightly more intelligent than either of the experimental groups. It might be argued that the increase in score of the experimental groups on retesting was due to its being easier to increase a score from a relatively low point than from a relatively high one. This argument is not likely to be valid in this particular case for the maximum score in each form of the test is 80–81, and the average score of the control group is only 50·7. However, to investigate this possibility the average scores of the two experimental groups in the first test were made as nearly equal as possible to that of the control group by eliminating the poorest performers. It was found that the average increase in score on retesting was diminished to some extent, yet both the experimental groups agreed in showing an average increase in their retest scores of 2·7 points, or 6 per cent.

Results according to personality types.—Of the 67 patients who took part in the investigations a large group of 54 were suffering from conditions labelled as anxiety states, depression, or hysteria, 9 were schizophrenic, 3 had an obsessional neurosis, and 1 was epileptic.

Of the 54 patients in the large group, the 38 who were given benzedrine showed an average increase in score on retesting of 4·63 points, which is nearly double that of the 8 schizophrenics who showed an increase of only 2·37 points. There is some indication, therefore, that the effects of benzedrine, as might have been anticipated, are greater in cases of emotional disturbance than in patients exhibiting in addition a more profound total personality dissociation.

Study of individual cases.—Group experiments are obviously desirable in an investigation of this nature since they help to eliminate chance and personal bias. However, "average" reactions cannot be expected in everybody. There are so many variable factors influencing the effect of a drug on an individual's response that these should also be studied. Such variables would include physical and psychological disposition, purely transient changes of mood, suggestive influence of the surroundings, and personal reactions to the tests.

We have not been able to attempt a study of all these variables in our investigation, but it was considered of interest to pick out persons with large rises or falls in their scores (10 points or over) and examine them in more detail.

It was found that only seven cases showed a large change in their score on retesting not in agreement with the general trend of the findings in their respective groups. All three in the control group carried the diagnosis of hysteria. Of these, one whose score fell (−10 points) reported that she had been hampered by headaches during the test, another with an improved score (+19 points) said she had been frightened by the first test but had got used to the test situation on the following day. Of the remaining four patients, who were in the experimental group, only two with a diagnosis of depression showed a large fall in their score following benzedrine; one of these (−12 points) explained it by saying that he did not bother so much about the second test. This effect was thought to be due to the euphoria produced by benzedrine, since normally he was a very conscientious and serious person.

As many as 10 out of the 48 patients in the two experimental groups increased their score by 10 points or more on retesting after benzedrine. Of these, some referred to an improvement in their somatic sensations when asked how they could explain their improved scores, others felt better able to do intellectual work after taking the drug. It was interesting to find that a few thought they had done worse though their actual scores showed a large improve-

[1] See Cattell, R. B.: A Guide to Mental Testing, London, 1936, p. 22. Cattell's figures must of course be halved for comparison with our results.

ment. For instance, a young man suffering from a depressive state with anxiety features reported very unpleasant subjective symptoms, an increase of palpitations and sweating, yet actually he showed a large rise on retesting (+ 14 points). The psychological effect which appeared to account for this improvement was that he was able to overcome his feelings of hesitancy and make up his mind more quickly. Two other patients (+ 12 and + 17 points) gave a similar explanation of their improved scores. It appeared that mental retardation in particular improved under this drug. Only one schizophrenic showed a large improvement after benzedrine (+ 12 points); he was in a state of remission during the experiments and normal except for a lack of initiative which the drug appeared to help him to overcome.

DISCUSSION OF RESULTS

These results are published in the hope of stimulating other clinics having adequate facilities at their disposal to record additional findings.

It must be remembered that this investigation was done on a very mixed series of patients. Signs are not wanting to suggest that certain types of cases respond better than others, and it may be that when further investigations are done on more homogeneous groups, more conclusive data may be obtained. The dose too might be varied as there are indications that different patients require varying amounts of the drug to produce the maximum effect. These results are concerned with the temporary effects of a single dose. What the effects of continued administration are have yet to be studied.

Although other workers have suggested that caffeine improves mental efficiency and alcohol lessens it, no published results have been found which report the effect of these drugs on similar groups of patients undergoing standardised intelligence tests. Further work on this point is obviously needed so that our findings may be compared with those obtained with such drugs. Ephedrine also might prove worthy of investigation owing to its action on the sympathetic system. The present findings appear to offer a new experimental approach to studying the effect of non-intellectual factors in intelligence test results. In addition they provide suggestive evidence that this drug may be found useful to a certain number of people who are handicapped by anxiety, mild depression, or retardation, and require temporary relief of these symptoms for the performance of an important task.

SUMMARY

An investigation was undertaken to discover the effect of benzedrine on the intelligence test scores of a group of patients at the Maudsley Hospital. The results were that a control group, given inert tablets, showed no average alteration in score on retesting. Two experimental groups given benzedrine showed an increase in score of approximately 8 per cent. The chances against this increase being purely fortuitous are about 7 to 1, and there is some indication that the drug has more effect on patients suffering from purely emotional upsets than on cases of schizophrenia where the personality changes are more profound.

Our thanks are due to Prof. E. Mapother for permission to use cases under his care at the Maudsley Hospital, and to Dr. E. Guttmann for his advice in these experiments and his coöperation in assessing the results on individual patients.

VENTRICULAR COMMUNICATION AND INTERNAL HYDROCEPHALUS AS COMPLICATIONS OF BRAIN ABSCESS

WITH A REPORT ON THREE CASES OF OTOGENIC TEMPORAL LOBE ABSCESS RECOVERING IN THE PRESENCE OF VENTRICULAR COMMUNICATION*

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THE purpose of this paper is to present certain facts concerning the establishment of a communication between the lateral ventricle and an abscess of the brain, and to discuss the theoretical aspects of the problem. The discussion, which is confined to cases arising in association with otogenic temporal lobe abscess, includes of necessity some attention to the internal hydrocephalic factor.

Study of a group of cases has demonstrated the following causes of ventricular communication:—

(1) *Surgical trauma.*—This is mentioned in passing but is not concerned in the present discussion.

(2) Communication is commonly established by simple *approach of the necrotic process towards the ventricle.* In rapidly spreading lesions, especially if of arterial origin, the disease may be so poorly resisted that the ventricle is eroded quite early; in less acute cases, the accident may occur after a few weeks or even much longer.

(3) The communication may arise as a result of *rupture of the ventricle into the abscess,* provided that, among other things, there is high pressure in the ventricular system.

Three cases of ventricular communication will now be presented. The recovery of all three patients renders proof by the morbid specimen impossible, but the factual evidence seems to provide reasonable grounds for regarding the third cause of ventricular communication as the one responsible.

THE CASES

CASE 1.—A girl, aged 16, came to hospital with a history of having had a feverish cold four weeks previously, accompanied by left earache. Five days later she had developed otorrhœa, which "dried up." Ten days before admission, after being up for a while, she had severe headache and vomiting, with a temperature of 101° F. A similar attack five days before admission was followed by drowsiness.

Examination.—Slow cerebration and drowsiness; sordes and fœtid breath. Complained of severe headache when roused. Left ear showed active acute attic disease. Bilateral papilloedema. Slight right facial weakness on emotional movement. Limb reflexes not elicited. Some loss of tone in right arm. Temp. 97° F.; pulse-rate 60; blood pressure 84/56.

Operation (day of admission).—A radical operation was found necessary to give access to the area of necrotic tympanic tegmen. There was an extradural abscess and granulations above, and a small dural track was visible, the dural incision being filled with crowding brain. Exploration immediately deep to the cortex produced a tremendous spurt of blood, flaky pus, and cerebro-spinal fluid, the stream being powerful enough to overshoot the edge of the table; it consisted mainly of cerebro-spinal fluid, and the total quantity evacuated must have amounted to several ounces.

Post-operative.—Little real anxiety was felt after the first 24 hours. Cerebro-spinal fluid was seen at each dressing for three or four days. In spite of what I would now

*Cases 1 and 2, together with some portions of the text, formed part of an essay submitted for M.D. (University of Durham, 1935), and are published by permission of the council of the University of Durham college of medicine.

regard as excessive interference and over-zealous instrumentation, and because of good localisation in the lesion, the patient recovered and left hospital on the 59th post-operative day. There was no trouble with brain fungus.

Subsequent history.—I saw this patient at intervals up to about five years after her illness and, apart from deafness consistent with a unilateral radical mastoidectomy, she appeared to be a well-developed, mentally normal young woman.

It may be added here that the history as given might suggest an operation on the 10th day of intracranial disease; this is, I think, due to my inadequate notes and to lack of careful inquiry into the precise details of the earlier days of the illness. I have several reasons for believing that the intracranial invasion arose during the early phase.

CASE 2.—A girl, aged 11, was admitted after seven weeks' otorrhœa. She had had a febrile attack soon after the onset, with vomiting, drowsiness, and diffuse headache. After some improvement a similar attack occurred about the 6th week of the illness, and symptoms became severe. On the day before admission the doctor noted: "Severe headache, pale, heavy-eyed and listless; fainted and began to wander. Temp. 99·5°; pulse-rate 54."

Examination.—Gross drowsiness and slow cerebration. Temp. 97°; pulse-rate 56. Left ear: high perforation with scanty, thick non-fœtid pus. Bilateral papillœdema; moderate rigidity of neck; nothing significant in central nervous system. Some hours later the pulse-rate was 50 and the patient almost comatose.

Operation (day of admission).—Conservative exposure demonstrated necrosis of tegmen antri and dural granulations. A walnut-sized cavity, containing semi-solid necrotic debris, was entered just deep to cerebral cortex. In essence this cavity was "marsupialised"—quite unintentionally however. The introduction of a probe beyond this resulted in a smart flow of clear cerebro-spinal fluid, some "pea-soup" pus, and then further cerebro-spinal fluid. The cavity was drained by two thin strips of corrugated rubber. The pus showed long-chain streptococci. Cerebro-spinal fluid obtained by lumbar puncture after operation had a cell count of 188, but no organisms were demonstrable.

Post-operative.—Cerebro-spinal fluid was observed at dressing for three days. Apart from pyodermatitis during the 5th week, there was no cause for anxiety after the 3rd day. The patient left hospital, in very good condition, on the 47th post-operative day, despite much over-interference.

Subsequent course.—I was informed by the patient's doctor (August, 1935) that her condition remained in every way satisfactory three and a half years after operation.

In this case there seems little room for doubting that the initial cerebral invasion occurred at the time of the first febrile attack in the early days of the illness; hence I assume that the lesion was approximately six weeks old at the time of operation. It has been difficult to account for the "debris cavity" adjacent to the real abscess; it is possible that it represented an area of brain tissue in a state of pressure necrosis.

CASE 3.—This patient, a woman aged 37, was admitted during an acute exacerbation of infection in a previously damaged left tympanum. I have to confess that I discharged her again after nine days, at a time when she must already have developed an intracranial lesion. This mistake resulted from inadequate observation, and to a still greater extent from an over-willingness to regard the patient as being of a slow-witted, complaining type—when in the light of later events it is clear that her state of mind was due to central invasion. On readmission a review of the chronological history from the very beginning of the illness indicated a diagnosis of intracranial abscess of 30 days' duration. In addition to signs of high tension, aphasia was notable and wide, and papillœdema was fairly marked. My pre-operative notes read: "(1) An intradural compressive lesion has been present for 30 days, perhaps a day or two longer. (2) There is now a large (left) temporal lobe abscess rather further back than usual, with fair localisation and some internal hydrocephalus. This view seems to be more reasonable than that of a small abscess with severe œdema, having regard to the present degree of intracranial tension. (3) Exploratory mastoidectomy at least is indicated. Intradural measures may be decided then or later."

Operation (day of admission).—Extradural pus and granulations were found in the middle fossa close to the tentorial extremity. The invasive site was probably in this region. The dura was extremely tense, and this factor decided tapping. Through a small dural nick a large posterior temporal lobe abscess was tapped by means of a brain needle. The stream was observed carefully; thick pus flowed smartly at first, but after a while it became obvious that pus of moderate thickness was flowing out alongside, but not intimately mixed with clear cerebro-spinal fluid. The rapid flow of pus suggested an abscess wall of no great rigidity with compression from without as the content was evacuated, and the flow of clear cerebro-spinal fluid indicated ventricular rupture during evacuation. Operation terminated after simple evacuation and patient returned to bed.

Previous experience had given me the impression that continuous drainage in a non-rigid, and therefore rapidly ablating, abscess was attended by results which were either useless, owing to extrusion of the drainage material, or disastrous from pressure-ulceration of the distal wall. This view was the basis justifying my returning the patient without a drainage-tube of any sort, in spite of the ventricular rupture.

Post-operative.—On the 3rd day, solely because of the ventricular accident, a single needling was tried, but with negative result. This procedure was repeated on the 7th day with similar result; meanwhile no clinical signs of meningitis had been noted. On the 12th day there was no evidence of subsidence of papillœdema. On the 15th day "this patient is at least in a stage of quite good localisation, free from headache, no vomiting, no drowsiness, pulse seldom much below 80, yet discs show increasing change. The clinical picture at present would indicate that, if pus is again present, the lesion is very little more than space-consuming. It must be remembered, however, that the original tapping with evacuation of an enormous quantity of pus and cerebro-spinal fluid would amount in some measure to an internal decompression." On the 18th day, because of increasing aphasia, another tapping was undertaken; half an ounce of thick pus was evacuated in a very slow stream, and a thin rubber strip was inserted along the track. "An abscess, not now communicating with cerebro-spinal system, with a degree of localisation sufficient to provide some rigidity in its walls; age now 48 days." On the 21st day the patient was not so well and there were signs of moderate compression. Removal of rubber strip was followed by a slow trickle of thinner pus (3ii). The drain was reinserted. On the 23rd day the patient's condition was worse, and half an ounce of pus was evacuated, at first under tension. On the 24th day she was again worse, and over an ounce of fœtid pus was evacuated through a metal catheter (Eustachian) which was left in situ for half an hour (No. 6 catheter drainage employed). The 26th day saw a change for the better. The catheter had been extruded and no pus was found. Thereafter her condition rapidly improved and she went home on the 47th post-operative day (77th day of lesion). The aphasia had by this time almost disappeared and the discs were subsiding.

Subsequent course.—I have seen this patient at intervals during the past 18 months. About six months ago she experienced some kind of fit, losing consciousness for a few minutes. My friend Mr. A. R. D. Pattison points out in this connexion that in such a case the abscess scar must be adherent to the lateral ventricle and pulling on that structure. Apart from this accident, there has been nothing noteworthy since her discharge from hospital.

Admitting that the records of Cases 1 and 2 are faulty in places, from inadequate knowledge at that time, I feel that in all three patients there was certainly a rupture of the homolateral ventricle, with the proviso that the moment of rupture was

determined by the fall in intra-abscess tension consequent on surgical evacuation. I have previously mentioned that it is only possible to discuss the conditions necessary for such an accident on theoretical grounds. My own explanation is as follows :—

(*a*) The suppurative lesion had advanced so far that only a thin shell of brain tissue separated the abscess from the ventricle. This is not to say that localisation (walling-off) was poor, for I believe it to have been well enough established for surgical purposes in all three.

(*b*) There was present in each some degree of internal hydrocephalus, severe in Case 1, of moderate severity in Case 2, and of milder degree in Case 3; nevertheless, in the last case the intraventricular tension was high enough to rupture the tissue separating the two cavities, during evacuation of the abscess.

Certain points in the causation and evaluation of internal hydrocephalus may now be considered.

INTERNAL HYDROCEPHALUS

Though the importance of this factor is well recognised, the degree of tension which may exist during life is not often observable in acute abscess cases, largely because ventricular interference may be dangerous. Further, the post-mortem findings, in my opinion, are very deceiving, from the fact that the undilated, or slightly dilated, cavities suggest but a minor degree of pressure. The comparatively negative findings arise from the short course of the disease, the duration of pressure not being sufficiently long to produce such marked changes as are customarily seen in tumour-formation. The three cases of ventricular rupture just recorded, especially Case 1, demonstrate that tension may be severe and that its relief under certain circumstances may make for rapid recovery.

Observations have suggested that the hydrocephalus depends on an obstruction to free circulation resulting from pressure exerted by the abscess and its associated œdema, together with displacement of the brain stem in some cases. In the case of the third and fourth ventricle the problem is comparatively straightforward, but it is more complicated in the case of the lateral ventricle. At this level the greater anatomical complexity of the system renders it possible for a single segment of a ventricle to be shut off, with the formation of a "loculated hydrocephalus." Bagley's case [1] of abscess erosion into an isolated patent posterior horn is of interest in this connexion. Cairns and Donald [2] state that "the ventricle is always collapsed on the side of an abscess and is normal, or slightly larger than normal, on the opposite side." My own observations suggest partial agreement with this view, for whilst it is true that some portion, even the greater portion, of the ventricular body may be compressed, certain segments (anterior, posterior, or inferior horn) may continue to be patent in spite of the surrounding pressure, and therefore tension may be significant in these. In the event of the necrosis, associated with an abscess, approaching any portion of a ventricle in a state of tension, it is possible that rupture may take place from within outwards—in short, a rupture of ventricle into abscess and not of abscess into ventricle.

No probable site of rupture can be suggested in Case 3, for here the amount of cerebro-spinal fluid might have been supplied by a single segment, or "ventricular loculus." In Cases 1 and 2, however, the amount of fluid indicated a reservoir of much greater capacity than one segment. In Case 1, at least, some conclusions seem justifiable. Here the abscess was sufficiently large to cause extensive compression of the homolateral ventricle, and from the large amount of cerebro-spinal fluid evacuated, the rupturing segment was probably the anterior horn and adjacent part of the body, a degree of patency which would allow of communication with the ventricle of the opposite side.

Turning from particular cases, the importance which this hydrocephalic factor assumes in relation to the disease in general may be worth consideration. In uncomplicated brain abscess, the mechanical factor takes precedence over the infective agent, for in the absence of some such accident as ventricular erosion, death supervenes from progress of tension to a fatal pitch. In the earlier phases, that is to say until the lapse of two or three weeks, the main compressive factor lies in the widespread œdema produced by the presence of an unlocalised lesion. Later, with improved walling-off, this œdema tends to be increasingly limited, but at this time progressive internal hydrocephalus may become a significant factor. Such a combination, if it does occur, would indicate that increasing compression after the third week of the disease is by no means always an index of failing localisation; it may be that advancing internal hydrocephalus exists alongside improving localisation, so that the general compressive syndrome continues to increase, though at a lesser rate.

POSSIBLE TREATMENT

If it be granted that the hydrocephalic element is important, and bearing in mind the satisfactory outcome of the three cases already described, the question now arises as to whether any measures should be adopted to counter this factor. Three aspects of the problem may be discussed :—

(1) Should the ventricular system be tapped? Much rumination leads me to answer this question in the negative, though I am aware that Atkinson [3] regards the procedure as relatively safe. My reasons are as follows. Internal hydrocephalus is of lesser importance than diffuse œdema in that phase when abscess interference is contra-indicated, and later other measures are preferable; the advance of this factor is relatively slow and its assessment usually possible under observation. The dangers are those of rupture of the abscess into the decompressed ventricle, and of possible failure of abscess localisation from a sudden alteration in the distribution of intracranial contents. In any planned procedure it would be difficult to repeat the same conditions as were present in the three cases of rupture.

(2) Should measures other than direct interference be adopted? At the phase when hydrocephalus is probable, the possibility of direct abscess interference, either by tapping or drainage, arises. Believing that, in this stage of the disease, tension increases relatively slowly, I prefer to observe the case closely and defer evacuation as long as possible, even up to the 5th or 6th week of the lesion. If intervention is not delayed unduly, evacuation of the abscess content will usually relieve the pressure responsible for the block in cerebro-spinal circulation, and much more safely than by direct interference with the system.

(3) Dehydration therapy may be used as a means of limiting the production of fluid. Beyond finding that this measure has a sphere of usefulness, I have no controlled observations to record. The work of Temple Fay, [4] though relating to traumatic cerebral conditions, may be found to teach lessons applicable to abscess.

CONCLUSIONS

1. Ventricular communication may arise as a result of the rupture of ventricle into abscess. Recovery may follow.

2. It is clear that internal hydrocephalus is sometimes considerable, and may constitute a significant factor in increased tension.

3. Accidental relief of pressure from this cause is on occasion beneficial, but it is suggested that direct surgical attack on hydrocephalus is fraught with danger.

4. Internal hydrocephalus probably assumes an important rôle at a time when dehydration therapy and evacuation of abscess content provide the safest control.

Case 1 was admitted under the care of my former chief, Mr. S. S. Whillis, and operated on by my present chief, Mr. W. Frank Wilson, whom I have to thank for the privilege of the conduct of Cases 2 and 3.

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TRICHLORETHYLENE AS A SKIN AND WOUND CLEANSER

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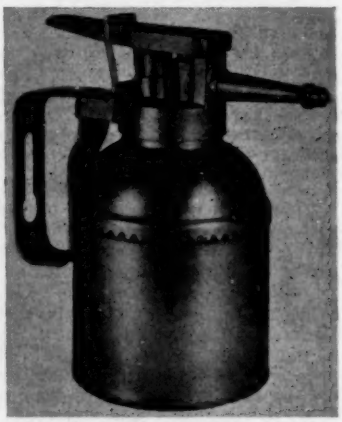
Cuts and burns are of frequent occurrence in most industrial concerns, and many of the resultant wounds, particularly in engineering and allied occupations, arise when the skin is dirty and greasy. The presence of fat-occluded dirt in a wound renders the appropriate treatment difficult; consequently a rapid, safe, and efficient method of cleansing would be of great advantage.

Trichlorethylene is being used industrially for metal degreasing, for dry cleaning, and as a solvent. It is a colourless non-inflammable liquid, and is an efficient solvent of all fats. It has an odour similar to that of chloroform and its general properties also resemble those of chloroform. It boils at 87° C. (chloroform 61° C.). It is less potent than chloroform as a narcotic, and it has been used as a general anæsthetic. Its effect differs, however, from that of chloroform in that no liver or kidney degeneration develops on prolonged exposure to sub-narcotic concentrations.[1] It resembles chloroform in tending to decompose on exposure to light, but such decomposition can be retarded by means of stabilisers which do not interfere with its essential properties and by storage in an approved amber glass bottle.

The substances most commonly used for the cleansing of wounds are ether and spirit, neither of which has the fat-solvency of trichlorethylene. In addition, of course, these products are highly inflammable and may give rise to accidents such as those described in the reports of the medical protection societies for 1935.

Trichlorethylene has been used as a wound cleanser in twelve factories of the I.C.I. (Metals) Group for three years. In a single year over 50,000 first dressings were carried out in these factories, of which at least one-third received preliminary treatment with trichlorethylene. A quarter of the persons treated were females. Trichlorethylene has been used at the Billingham works of the I.C.I., and it is estimated that 40,000 cases have been treated at these works with a preliminary washing with trichlorethylene. It has also been used for some time in the casualty department of the Birmingham General Hospital, and has recently been tried by casualty officers of the Army and Navy and by a limited number of general practitioners.



Trichlorethylene sprayer used for wound washing.

The majority of the wounds treated with trichlorethylene in the I.C.I. factories have been cuts of the fingers, but it has also been employed for lacerations and burns of other areas. The general principle has been to treat all dirty and greasy wounds with trichlorethylene, irrespective of size or severity. It is applied with an Enot Spray (see Figure), made by Messrs. Benton and Stone, which is held at a distance of ½–2 in. from the wound. The amount used varies according to the size of the wound and the amount of grease, &c. The use of large amounts does not adversely affect the subsequent treatment of the wound. The trichlorethylene dissolves the oil and grease and flows away as a dirty liquid; after which the wound presents a moderately clean appearance. An antiseptic such as flavine is then applied and the wound is dressed in a normal manner. Any slight irritation caused by the trichlorethylene is immediately allayed by the application of an antiseptic.

The results of the aforementioned treatments have been closely observed, and it can be stated that the use of trichlorethylene has neither delayed healing nor predisposed to sepsis. The following cases illustrate the healing of minor, intermediate, and severe wounds treated in this way.

Case 1.—Bricklayer's labourer. Oct. 14th, 1935: contused wound of right index-finger due to trapping of the finger in a concrete-mixer. Oil and grease removed from finger with trichlorethylene and a Monsol dressing applied. Oct. 15th: dry dressing. Oct. 16th: finger healed; no further treatment necessary.

Case 2.—Office boy. Feb. 26th, 1936: lacerated wound of left knee from bicycle accident; oily wound, probably due to bicycle chain. Wound cleansed with trichlorethylene, and iodine and a dry dressing applied. Further dry dressings until March 6th, after which no further treatment was necessary.

Case 3.—Fitter. Jan. 14th, 1936: lacerated wound on the back of the left hand and index-finger with avulsion of the nail due to trapping the hand in machinery; the wound was contaminated with oil and bitumen. Cleansed with trichlorethylene; five horsehair sutures inserted and acriflavine applied. Redressed with this until Jan. 22nd, when the sutures were removed and iodine

[1] Taylor, H.: Jour. Indust. Hyg., 1936, xviii., 175.

and a dry dressing were applied. Feb. 3rd: returned to work with protection of the nail-bed.

CASE 4.—Labourer. Oct. 3rd, 1935: first-degree burns of the left forearm due to monochlornaphthalene from bursting of a pipe. Monochlornaphthalene was removed with trichlorethylene. Opium was not required for a burn of this extent, although the cleansing was moderately painful. Gauze soaked in Solubes of tannic acid (Martindale) was applied with a bandage, and more tannic acid was poured daily on the bandage without disturbing the dressing until Oct. 17th, when no further treatment was required.

Trichlorethylene has been found beneficial in the treatment of tar burns, and an outstanding case has been recorded by one of us (H. B. T.)[3] in which the serious effects of large burns were avoided. It has almost no antiseptic power, however, except when emulsified with water. (In such circumstances its Chick-Martin coefficient is 0·9.) Hence in most cases it is advisable to treat the wound with some recognised antiseptic after the preliminary cleansing with trichlorethylene. There is no evidence that the trichlorethylene affects the efficiency of the antiseptic, and no contra-indications to the use of trichlorethylene have been observed. It does not injure the skin when applied frequently over long periods, and when used as soap (i.e., Westropol) it is of particular value for routine cleansing of the skin of workers who use tar and allied products. Thirty workers employed on tarring containers have used westropol continuously for cleansing their skin over a period of two years, and in no single instance has any deleterious effect on the skin been noted. After using westropol they rub into the skin a mixture of lanolin and cotton-seed oil to replace any fat which has been removed, and the skin of their hands and forearms is in very much better condition than that of the average workman.

The chief precautions to be taken in using the trichlorethylene spray for wounds is to ensure that the ventilation of the ambulance room is adequate to prevent any narcotic symptoms arising. It is also advisable to prohibit smoking while the spray is being used, since there is a possibility of injurious decomposition products being inhaled by the smoker.

[3] Brit. Med. Jour., 1934, ii., 1219.

CLINICAL AND LABORATORY NOTES

A CASE OF SIMMONDS'S DISEASE

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Simmonds's disease, or pituitary cachexia, is a clinical state caused by destruction of the anterior lobe of the pituitary gland and characterised by extreme loss of weight, premature senility, and loss of sexual function. There are also typical skin changes with loss of hair and teeth and lowering of the general metabolism as shown by hypothermia, bradycardia, and low blood pressure, together with mental retardation usually associated with depression, inertia, and irritability. Originally described by Simmonds in 1914[1] the condition has since been reported frequently on the Continent, but very seldom in England.[2-4]

The disease is progressively fatal and usually terminates suddenly. Its duration is usually one or two years, but it may be only a few months, or on the other hand the patient may live 30 or 40 years. Where it has lasted a considerable time there is a curious shrinkage of the viscera, known as microsplanchnia, and secondary atrophy of all the other endocrine glands.

The disease is commoner in women than men and often follows pregnancy. Other causes include tuberculosis, syphilis, metastatic abscess, thrombosis and embolism, tumours and fracture of the skull with hæmorrhage about the midbrain. In the following case it was the result of embolic infarction immediately after the end of a pregnancy.

A married woman, aged 26, was first seen on March 4th, 1936, at the Royal Free Hospital. Two years previously she had had a normal pregnancy and been delivered of a baby weighing 10¼ lb. She had always been healthy and had had no serious illness. On Nov. 7th, 1935, she had given birth to twins—labour being induced for toxæmia at 8½ months. Dr. J. Hepburn, to whom I am indebted for these particulars, states that about five minutes after the delivery of the second child she suddenly collapsed, although there had been no excessive bleeding. An injection of 15 minims adrenaline was given and she gradually recovered, but three days later she developed severe headache and was unable to sleep. The urine was normal. After a further two days she discovered that she was unable to see anything. The headache lasted about six days and gradually faded, but the blindness persisted. Three weeks afterwards her fundi was examined and a diagnosis of hæmorrhage and destruction of the right optic nerve was made. The left fundus was normal; the total blindness was accounted for by the fact that as a child she had had a squint in the left eye which had been corrected, and that this eye had remained "lazy" and had never been properly used. The patient meantime remained very depressed, took no interest in the twins, refused her food, and looked pale and ill. Her condition continued to deteriorate during the next two months, and on March 4th she attended the Royal Free Hospital.

There she complained that she felt persistently weak and listless and was always cold. Her eyesight was still very poor, but it had improved and she was now able to recognise large print. She still suffered from anorexia and up to a week previously had vomited frequently. (The husband stated afterwards that she complained that everything tasted salty and that though often thirsty, she only cared for water to drink.) Her weight before the beginning of the last pregnancy had been 11 st. 8 lb. and was then only 8 st. 2 lb. For a few weeks after the confinement she had suffered from insomnia, but since then she had been sleeping more soundly than usual. Her hair, which had previously been thick and glossy, had recently become brittle and was now falling out in handfuls. There had been no return of the menses since the puerperium.

On *examination* she appeared at least fifteen years older than her age. She was slow to answer questions and her speech was rather slurred, which gave the appearance of mental sluggishness. There was a curious marble pallor of the face and the mucous membranes were pale. The skin was dry, with a shiny contracted appearance, whilst over the abdomen it was conspicuously coarse and thickened, with a deep brown pigmentation and superficial desquamation. The patient was very thin and there had been much recent loss of weight. The scalp hair showed definite areas of alopecia. Axillary and pubic hair were both present. The nails were brittle and shiny, but there was no flattening. The blood pressure was 118/88 and the right fundus showed optic atrophy.

A provisional diagnosis of pituitary aplasia was made and the patient admitted on April 3rd for further investigation. Her condition was much as it was when first seen except that she had lost a further 7 lb. in weight. Her sight was further improved and there had been no recurrence of the vomiting.

Special investigations.—Right eye: vision less than 6/60; optic atrophy and macular degeneration; uniform

contraction of field of vision. Left eye: vision 6/36; no definite optic atrophy and macular region normal; field of vision contracted. Radiography of skull: pituitary fossa deep but clinoid processes quite normal. Wassermann reaction of blood negative. Blood count: hæmoglobin, 55 per cent.; red cells, 4,840,000 per c.mm.; colour-index, 0·57; white cells, 5650 per c.mm. (polymorphs 51 per cent., lymphocytes 45·5, eosinophils 1·0, monocytes 2·5). Blood-urea: 61 mg. per 100 c.cm. Urea concentration (15 g. urea in 100 c.cm. water): maximum value 2 per cent. urea. Fasting blood-sugar: 0·068 per cent. Glucose tolerance: (after 100 g. by mouth) ½ hour, 0·120; 1 hour, 0·100; 1½ hours, 0·100; and 2½ hours, 0·068.

Progress.—The patient was kept at rest and given iron and ammonium citrate (90 grains daily). Her urine output varied between 30 and 74 oz. daily, with a maximum

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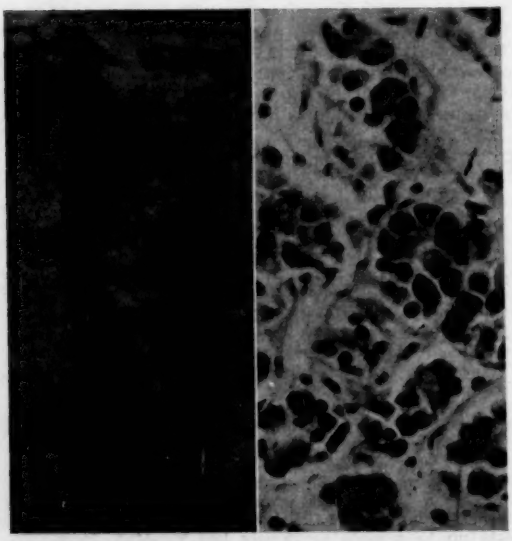

FIG. 1.—Section through anterior lobe showing replacement of normal cellular pattern by a matrix of loose fibrous tissue. (× 215.)

FIG. 2.—Similar section through pituitary gland of a normal female, aged 33, to show normal glandular structure. (× 215.)

specific gravity of 1015. At no time was there any albuminuria. The pulse-rate remained between 60 and 88, the temperature (mouth) was 97°–98°, and the blood pressure 110/72–100/50. The hæmoglobin rose from 55 per cent. to 70 per cent. in one month and the blood-urea fell to 38 mg. per cent. She put on 2 lb. in weight and her general condition improved slightly. Her mentality on closer observation appeared fairly normal and she became much less depressed. Her appetite and eyesight improved considerably and there was no further loss of hair.

She was discharged on May 5th and remained at home quite well till two days before her death on August 12th. Her husband reported that during this time she appeared much more cheerful and active than previously, never suffered from headaches, and ate and slept normally. There had been no return of the menses and the weight remained stationary. She occasionally complained of backache. On August 10th she complained of a headache which persisted and was associated with definite photophobia. Twenty-four hours later she had a transient phase of incoherent speech. Early next morning she was found lying in bed with her jaw set and her hands tightly clenched ("as though she had had a convulsion"). She was completely unconscious and vomited once. She was immediately admitted to St. Mary's Hospital, Highgate. She was then speechless, lay curled up in bed avoiding the light, and was extremely irritable. Five hours later she died.

Post-mortem examination.—The following is a summary of the finding sent me by Dr. W. G. Barnard from the Archway Laboratory (L.C.C.): "(1) Extremely scanty degenerate anterior lobe cells in a fibrotic œdematous anterior lobe of pituitary. (2) Posterior lobe slightly smaller than usual but cells normal. (3) Multiple hæmorrhages in both lungs and slight broncho-pneumonia. (4) Congestion and œdema of liver. (5) Thyroid normal in size. (6) Spleen normal size. Slight excess of polymorph cells. (7) Cortex of suprarenals definitely shrunken. (8) Slight diffuse fibrosis of cortex of kidneys. (9) Congestion and œdema of brain."

Dr. Barnard kindly let me have the remains of the pituitary gland for further examination. The anterior lobe was extremely shrunken and had a homogeneous gelatinous appearance with complete loss of the normal pattern. The section showed a collection of loose œdematous fibrous tissue in which it was impossible to detect any normal functioning gland cells. (Figs. 1 and 2.)

Many of the reported cases of Simmonds's disease have not been recognised till after death, but in this case the diagnosis was made early. The sudden onset of the illness after a confinement was clearly associated with the presence of multiple emboli in the circulation, one of which lodged in the artery supplying the anterior pituitary while another obstructed the right retinal artery. The subsequent effects of pituitary deficiency were shown by the loss of weight, the anorexia and vomiting, the loss of hair, and change in texture of the skin. There was also an anæmia with low colour-index, a low blood pressure, and a low resting blood-sugar with increased glucose tolerance. Whilst there was at first distinct apathy and exhaustion there were no other conspicuous mental symptoms and, after the acute onset, no headache.

The pigmentation of the skin over the abdomen has been observed in many other cases and is possibly related to suprarenal deficiency. Absence of menstruation is also a usual finding and indicates a reduced functional capacity of the ovaries; but in this case it must be remembered that the patient only survived nine months after the termination of her last pregnancy. Bradycardia, eosinophilia, and hypothermia, which have been described in some of these cases,[5] were absent here. Post mortem there was no microsplanchnia, probably because of the relatively short duration of the disease.

The complaint of the salty taste in the mouth is of interest in view of the fact that these cases have been found to have a poor ability to excrete NaCl (Zondek,[6] Marx,[7] also Jungmann[8]). Unfortunately in this case the symptom was only reported by the husband after the death of the patient and the point was not investigated.

The sudden termination of the illness after what appeared to be a partial recovery is of great interest. A similar sudden end after a slight but definite improvement is reported in other cases, particularly that of Aitken and Russell.[2] It is a reminder that in cases of sudden death in patients who have supposed to be suffering from indefinite nervous symptoms of the "anorexia nervosa" type and in whom no obvious cause is seen post mortem, the pituitary gland should be specially examined. A similar dramatic end with brief terminal cerebral irritation suggestive of cerebral hæmorrhage is sometimes seen in cases of Addison's disease.

The patient was under the care of Dr. Dorothy Hare and Dr. D. T. Davies to whom I am grateful for permission to publish the case. My thanks are also due to Dr. Hepburn for details of the patient's history, and to Dr. Barnard for the use of his pathological report.

(*References at foot of opposite page*)

A CASE OF PULSUS ALTERNANS

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THE following case may be of interest because of the bearing it may have on the causation of pulsus alternans.

A woman of 60 known to have high blood pressure for about eleven years was admitted to Selly Oak Hospital on April 29th, 1936, with severe epistaxis. Her heart was found to be much enlarged to the left, the position of the apex-beat being in the sixth space in the anterior axillary line. On palpation at the apex one felt a strong beat followed by two weaker ones, and on auscultation the same sort of thing could be appreciated from the intensity of the heart sounds. In addition, the second weak beat appeared to be somewhat premature in relation to the other two. At the wrist a regular sequence of three beats all different in tension could be made out, a strong beat followed by a weaker one, and finally and somewhat prematurely a still weaker beat. Represented diagrammatically it would look something like this:

FIG. 1.—I = Strong beat. II = Weaker (alternating) beat. III = Extrasystole.

The rate at the apex and wrist was the same and varied between 70 and 80 per minute.

The blood pressure apparatus registered three different systolic levels in regular sequence: 210, 180, and 160 mm. Hg respectively, the diastolic being approximately 100 mm. Hg. A striking visual proof of the above finding was provided by observing the column of mercury in the sphygmomanometer, because at 210 mm. Hg it was seen to oscillate at one-third of the pulse-rate, at 180 mm. Hg at two-thirds, whilst at 160 mm. Hg all the beats were coming through. The electrocardiogram (Fig. 2) shows sinus rhythm with ventricular extrasystoles every third beat. The intervening "normal" beats appear equal in amplitude.

The patient, who lost a great deal of blood (on admission the hæmoglobin was 75 per cent. and the red cells 3,840,000), soon stopped bleeding and was improved by three weeks' rest in hospital, sedatives, and iron. She was seen subsequently as an out-patient on May 28th and June 11th, when the physical signs were found substantially unaltered. On August 7th a complete change was noted. Only a very occasional extrasystole was present and the blood pressure was 260/120 mm. Hg. No alternation was detected. The electrocardiogram taken on that occasion (Fig. 3) shows one ventricular extrasystole, but otherwise it is similar to the previous one. She remains comparatively well apart from moderate shortness of breath on exertion and a very occasional attack of paroxysmal nocturnal dyspnœa.

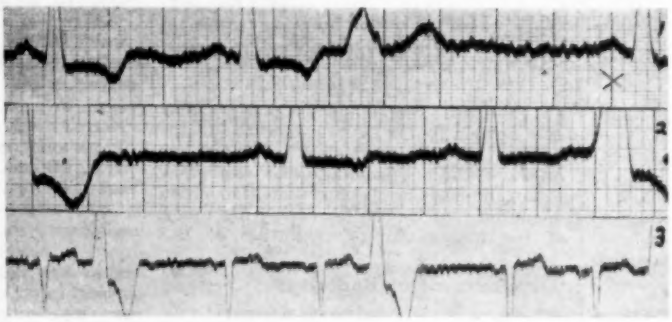

FIG. 2.—Ventricular extrasystoles occurring every third beat. Inversion of T_1 and T_2. Left axis deviation.

The case shows the association of a regular sequence of ventricular extrasystoles with pulsus alternans giving rise to three distinct levels of systolic blood pressure. It is known, of course, that premature beats may initiate or reveal a tendency to alternation, but I have not been able to find a record quite like this one, except for a tracing in Gravier's monograph[1] which bears some resemblance to the present case.

The explanation for the alternation which one is tempted to offer here is that the compensatory pauses which follow the extrasystoles (III) allow the ventricle to fill much better and thus produce strong beats (I). In the beats that follow (II) the ventricle has only the "normal" length of time to fill and thus they are relatively weaker. If this be the true mechanism of alternation in this case, there is no need to invoke the usual explanation for alternation—namely, partial ventricular asystole. It may also mean that in the presence of regular extrasystoles the prognosis of pulsus alternans need not be so gloomy.

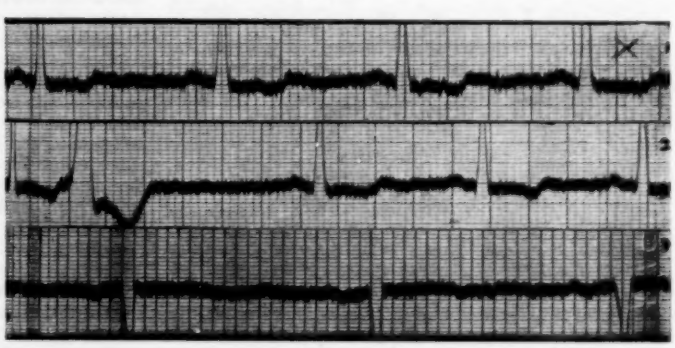

FIG. 3.—Single extrasystole recorded in lead 2. Inversion of T_1 and T_2 and left axis deviation as in Fig. 2.

[1] Gravier, L.: L'Alternance du Cœur. Paris, 1914.

(*Continued from previous page*)

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MEDICAL SOCIETIES

BRITISH INSTITUTE OF RADIOLOGY

THE tenth annual Radiological Congress and Exhibition was opened by Sir E. FARQUHAR BUZZARD on Dec. 2nd. Prof. J. A. CROWTHER, president of the Institute, introduced Sir Farquhar, who expressed his appreciation of the invitation and the great impression made on him by the increasing ingenuity and skill of the manufacturers exhibiting at the congress.

Development of Radiology

There had been, said Sir FARQUHAR, no such thing as radiology in his student days. Several other new developments since that time had made an instantaneous appeal to the public imagination; for example, bacteriology, modern psychotherapy, and endocrinology. The appeal to the public constituted a danger to the public, and exploitation had been seen in each case. Looking back, he was much impressed by the extraordinarily clean record of radiology in that respect. This he ascribed in part to the Institute; there was nothing quite like it in the field of medicine. Much good could always result from the common esprit de corps of a number of people engaged in the same problem, but looking at it from different angles. The Institute had performed a very fine piece of work since its inception. To some extent Lord Nuffield's recent benefactions to Oxford University had been excited by his interest in the X ray cinematographic work of Dr. Russell Reynolds, who had rendered great help in installing two of his plants in the Institute of Medical Research. The university had been very fortunate in securing the services of Dr. A. E. Barclay as hon. radiologist. X ray cinematography had a very big field in front of it; in the field of the ancillary sciences, and in research and teaching in those sciences, as well as in its direct application to medicine. Lord Nuffield's benefaction would be used, in general terms, to bring together the clinical and the laboratory side of medical research. This could be done in Oxford better perhaps than anywhere else. Advance in medical knowledge must more and more, he thought, result from combined team-work rather than from the isolated work of individuals.

Bone Tumours

On the following morning the chair was taken by Dr. RUSSELL J. REYNOLDS and Dr. J. F. BRAILSFORD opened a symposium on bone tumours, taking as his subject the importance of radiography in early diagnosis. Other methods of investigation were clinical and histological. A tumour might force itself on the patient's attention by size, restriction of joint, pain or persistent and severe pain after coincidental injury. A complete history was essential, but would not give definite diagnosis before the growth threatened the limb or the life of the patient. The evidence obtained clinically was extremely valuable, and might be essential, in interpreting histological or radiological data. Great difficulty might be experienced in distinguishing tumour processes from normal repair processes in bone. Often lesions with clinical and histological evidence of bone tumours proved to be traumatic. Histology might be the decisive evidence, but it should not be sought by biopsy until radiographic evidence had been taken. Radiology was the youngest of the three methods, and there was ground for the scepticism with which the conservative regarded it. The pictures submitted sometimes failed to give any demonstration of the phenomena referred to in the report, and were too often made by persons who did not know the anatomy of the parts. Bone and joint radiography seemed to be regarded by many doctors as the simplest branch of the art, but it was by no means simple. The radiologist must use special knowledge to form an opinion, based on clinical and pathological evidence, as to the interpretation of the changes shown by radiography. In many cases the radiographic changes were indefinite, and the report should contain mention of the conditions which might cause such changes, taking into consideration the clinical and pathological findings in the case. Each method of diagnosis played its part and none must be neglected. Innumerable indefinite features would loom each day before the seeker for early signs. Only by patient study would the radiologist learn how to distinguish them and just when and where truly characteristic features first appeared. This work demanded the best technique available. It was most important to obtain a complete radiographic record before instituting any therapeutic measure. Notwithstanding all the possible fallacies, radiology must be the first court of appeal in bone cases because it was capable of revealing the pathology before clinical or histological evidence could do so. A central bureau of information about bone tumours would be of the greatest value.

OSTEOCLASTOMATA AND ANGIOMATA

Osteoclastoma (formerly called myeloid sarcoma) bore an unknown relation to trauma. It was most often found about the knee or elbow, though it might appear anywhere. Metastases had been reported, though some observers had said they could only arise after malignant metaplasia. The simple nature of the true osteoclastomata was shown by the fact that they could be severely mauled by the surgeon without metastasis. They were seldom found early, and were usually sought because of tumour, dull pain, or spontaneous fracture. By this time the epiphysis had usually fused and extensive destruction had taken place. Dr. Brailsford thought they started in the juxta-epiphyseal area of the diaphysis. The epiphysis might be more rapidly destroyed because of its softness and vascularity. The tumour acted essentially as a solvent of bone; there was no sclerosis. The X ray showed a rarefied area, sometimes localised, sometimes replacing all the cancellous tissue. In the early stages no change could be detected in the bony shell. In the tumour area only a few strands of bone could be seen in the coarse mesh. The subarticular bony boundary showed temporary and protective sclerosis. The tumour grew expansively, but its cells did not invade the bone. Deposits of amorphous calcium might later blur the outlines and increase the density. Many lesions produced radiographic appearances which, to the casual observer, resembled those of osteoclastomata. It was important to know what treatment had already been applied as the effects of X radiation and α radiation suggested quiescence and healing. Regeneration and consolidation were very slow whatever was done, but the method of choice seemed to be curettage of the growth and replacement by bone chippings, provided the tumour

had not affected the stability of the limb. Patience was important. Radiation did destroy the tumour cells. Resection was better than radiation for degenerate tumours. Amputation should be reserved for cases where the tumour had seriously affected the use of the limb.

Angiomata were of three types: in one the whole bony structure was invaded and changed; in the second there was outgrowth from the surface. Some seemed to arise from trauma and others from congenital defects in the vessels. They were relatively frequent in the vertebræ and were increasingly frequent as age advanced. The involved vertebra was slightly broader and shallower than its neighbours. The bone was less dense than normal and showed coarse trabeculation following the normal architecture. The vertebra looked semi-translucent. Fibrous Paget's disease did not produce this phenomenon, and showed lesions elsewhere in the body. The vertebra might collapse or press on the cord. Lipiodol injections would reveal pressure areas. Rarely the long bones were affected: phalanges, for example. Lymphangiomatous enlargement of the limb might be associated with these changes in all bones. Such bones could not stand strain and would bend, producing gross deformities. The second type produced very different changes: fine bony trabeculæ radiated from a centre and became coarse and wavy, looking like a shaggy head of hair, and the tumour produced a bulbous or fusiform swelling with a regular periosteal border. No recurrence followed simple resection, and bone graft was usually successful in repair. The third type affected the ends of long bones and took the form of a soap-bubble-like expansion, with extensions into the cancellous tissue. It seemed to start in a subperiosteal hæmatoma. The outline was clear. It might be mistaken for osteoma. It seemed to respond well to radiation.

OSTEOCHONDROMATA, CHONDROMATA, AND BONE CYSTS

Dr. R. E. ROBERTS said that the anatomical and pathological facts known about these conditions of bone should be considered in their relationship to radiology. The subject bristled with difficulty; in no branch of bone pathology was knowledge more scanty. Osteochondromata, tumours of varying proportions of bone and cartilage, could be divided into simple osteochondromata and exostoses. The former were tumours whose radiological appearance depended largely on the relative proportion and distribution of bone, cartilage, fibrous and myxomatous tissues. The single exostoses grew near the ends of long bones and might cause pain from pressure on soft tissues or inflammation in the overlying bursa. Radiographically the tumours appeared as outgrowths on the diaphyseal side of the epiphyseal line, the ends being bigger and broader than the shafts. The most likely explanation of the tumour was that during growth a part of the edge of the metaphyseal cartilage became detached and continued to grow independently at right angles to the main line of growth. Growth ceased at the same time as in the parent bone, and the cartilaginous cap became ossified, unless malignancy supervened.

Multiple exostoses, better known as diaphyseal aclasia or hereditary deforming chondrodysplasia, usually appeared during the period of active growth and affected only bones in which cartilage came to be covered by periosteal bone. The condition did not affect bones formed entirely in cartilage or entirely in membrane. Clinically it caused shortening of stature and bowing of forearms and legs. Pain and dysfunction might result from pressure. Local exacerbations in patients over thirty might be the first indication of malignant change. The characteristic radiological appearance included broadening of the metaphyseal ends of the bones, thinning of the cortex, and wide, irregular translucent medullary spaces. The epiphyseal axis was often distorted. The essential factor was a retardation of the modelling process whereby new bone was pruned and incorporated in the intrinsic architecture of the shaft. There might also be aberrant growth of the cartilage cells.

Chondromata usually occurred between the ages of 20 and 30, and might be single or multiple. Those centrally situated showed as well-defined translucent areas in which there might be trabeculation. If they arose in the cortex, this was destroyed and had a depression on its surface. If the growth had perforated the surface, relics of its original cortical covering would be seen as bony flakes. Pathological fractures were frequent. Malignant changes might supervene, as in all growths where cartilage predominated. Ollier had described a unilateral variety of chrondrodysplasia in children, in which the lesions might be those of multiple exostoses or multiple enchondromata or both. The bones might show longitudinal striæ of translucency surrounded by lines of increased density; the nutrient foramina might be enlarged and there might be stippling.

The problem of bone cysts was a very difficult one; many conditions which were not cysts might give the radiological appearance of cysts, and the classification and pathological literature on the subject was confused. The solitary bone cyst was usually discovered by accident during X ray examination after trauma. It showed as a translucent area surrounded by a smooth, expanded, thinned cortex. Pathological fracture was frequent, but often the bones united to become stronger than before. The fibrous tissue in the condition known as fibrosis of bone was sharply differentiated from the bone and had all the radiological appearances of a large cyst. The difficulty was that a fibrous mass in the bone, a cyst in the bone, and a cyst in the fibrous mass all had an equal degree of radio-translucency. Many translucent areas which looked like cysts were not really cystic—e.g., the resorption of bone in osteitis deformans, or any form of demineralisation or defective calcification. The radiographic examination of the rest of the skeleton, the clinical picture, and the biochemical findings would usually give enough information to make the diagnosis clear. Myxomatous degeneration might take place in a chondroma and was usually characterised by a tendency to penetrate into the soft tissues and the demonstration of calcified remnants of the original cortex. Small round translucent areas near articular surfaces were sometimes seen around joints with chronic osteo-arthritic changes. They were caused by the fibrous degeneration of the cartilage and bone, and might contain giant cells. Bone might be involved in hydatid disease. Myxomata of bone were rare and showed local malignancy. Chronic osteomyelitis showed as a small collection of fibrous tissue in the bone.

In conclusion, Dr. Roberts urged coöperation between radiologists and pathologists. The radiologist was in a better position than the pathologist

because he could investigate any bone lesion, whereas comparatively few specimens reached the laboratory.

TUMOURS OF THE JAW

Dr. H. M. WORTH gave a classification of odontomes and said that dental cysts were the commonest tumours found in the jaws. They arose from normal epithelial cells which proliferated as a result of irritation from an infected tooth. The typical radiographic features were an area of bone destruction having no structure in the centre but a clear and well-defined cortex. Sometimes cysts with these appearances were found in the ascending ramus or incisor foramen. Histologically these were typical dental cysts. Occasionally it was difficult or even impossible to differentiate a cyst from a normal antrum. Points to notice were that the cortex of a cyst was usually more sharply defined and less wide than the antral wall; the cyst outline was more of a true circle; and grooves for vessels would show that a suspected area was not a cyst.

Dentigerous cysts usually occurred in young subjects and more often in the mandible than in the maxilla. Experts did not agree on their pathology. Radiographically they resembled a dental cyst, but with some part of a tooth or teeth in their cavity. Multilocular cysts were rare and almost confined to the mandible; they might be solid or cystic. The latter were commoner and the most familiar type showed an area of bone destruction involving the molar region and ramus. There was nothing to suggest multiloculation, but there was usually a coarse irregular trabeculation in the centre of the cyst. A second type showed many clearly defined cavities, and often a tooth inside the tumour. The solid type showed a honeycomb appearance with much smaller cells than the cystic type, and its differentiation from osteoclastoma was only suggested by the rather more clearly defined trabeculation and cortication of the latter. Complex composite odontomes were irregular masses of enamel, dentine, and cement of very varying size and location. They showed a very dense opacity with no regular structure or shape, separated from the surrounding bone by a narrow, dark space representing a fibrous capsule. These features distinguished them from osteomata. The compound composite odontomes were made up of any number of separate pieces. Sometimes the individual masses resembled small, badly formed teeth and had fibrous capsules. Geminated composite odontomes showed fused teeth or denticles. Dilated composite odontomes resembled teeth of which one part, usually the root, was hollowed out like a mushroom, or bulbous and clubbed. Osteitis fibrosa was not an odontome but was not rare in the jaw. Radiographically it showed much new bone formation of homogeneous density and a stippled appearance rather like orange-peel. This type occurred in the maxilla of young people and was quite soft and easy to remove. Another type occurred in older patients and was very hard indeed; under X ray the bone was dense and rather structureless. A third type occurred in the lower jaw and was found to be very hard. It caused considerable increase in the depth of the bone.

Primary Cancer of the Lung

Dr. A. C. CHRISTIE, president-elect of the International Congress of Radiology (Chicago, 1937), taking as his subject the diagnosis and treatment of primary cancer of the lung, said that in the last ten years over 500 papers on cancer of the lung had appeared. The disease had been looked upon as both rare and hopeless until 1912 when Adler published his description of 374 cases. Interest had recently been stimulated by several circumstances: (1) the fact that cancer of the lung appeared to be increasing in incidence, forming from 5 to 10 per cent. of all the autopsies on cancer; (2) the improvement in diagnostic methods, including the perfecting of X ray examinations and the introduction of bronchoscopy and bronchography. The pathology of the disease must, he said, be understood if it was to be correctly diagnosed. The types of pulmonary cancer included bronchogenic carcinoma, the epidermoid or squamous-celled type, adenocarcinoma and undifferentiated-cell tumour. From a practical standpoint, however, the position of the tumour was more important than its type or structure. Tumours arising in the peripheral portion of the lung were more likely to run a rapid course than those situated in a main bronchus. Bronchogenic carcinoma had a high rate of metastasis, and the metastatic lesions, frequently in the brain, were apt to make themselves felt before the primary growth was even suspected.

Early symptoms included persistent cough, pain in the chest, which was often localised by the patient directly over the tumour, dyspnœa, hæmoptysis, and fever. The physical signs were relatively of no importance, being usually merely those of some condition secondary to the carcinoma. A final diagnosis must depend on a combination of methods, of which X ray examination was the most important. Complications included obstruction to a bronchus, leading to atelectasis, and this in its turn to infection and bronchiectasis. An infected cavity was common and might be difficult to diagnose. Pleural effusion with a peripherally situated tumour might also confuse the picture. Here aspiration would help in the diagnosis, the fluid being centrifuged and the coagulum mounted in paraffin from which sections could be cut. Additional aid was afforded by a partial artificial pneumothorax. For accurate diagnosis, bronchoscopy was essential, but two points should be observed: (1) not to remove the sample through normal bronchial tissue; (2) to take the biopsy material from the tumour itself, and not from the inflammatory tissue surrounding it. A positive biopsy was valuable; a negative report should be received with reserve, since the bronchoscopist could not always see the tumour—e.g., if it was in an upper lobe.

After brief reference to differential diagnosis from bronchiectasis and abscess, Dr. Christie concluded with a few remarks on treatment. The criteria of operability must be established. Important contra-indications might be the position of the tumour (e.g., too close to the bifurcation), involvement of the pleura, and presence of metastases. Peripheral tumours were more amenable than others to radiation. The intrathoracic application of soft rays to the stump of a tumour might prove a valuable method in the future. What was needed now was alertness in diagnosis, and coöperation between surgeon, bronchoscopist, pathologist, and radiologist.

Two other symposiums were arranged. Dr. A. E. Barclay, who introduced the subject of anatomical variations of the alimentary tract, was followed by Sir Thomas Dunhill, Dr. Boulton Myles, and Dr. S. C. Shanks, who each took a special region of the tract. A series of papers were also read on the measurement of ionisation of currents. The seventeenth Mackenzie Davidson memorial lecture given by Mr. J. D. Cockcroft, Ph.D., is the subject of an annotation on p. 1409.

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT a meeting of this section on Dec. 2nd, with Prof. G. GREY TURNER, the president, in the chair, a discussion on the operative treatment of

Uncomplicated Inguinal Hernia

was introduced by Mr. GEOFFREY KEYNES. He said it was difficult to exaggerate the importance of the disability since it affected an enormous number of able-bodied people, and was thus probably of even greater economic importance than cancer. He had long been dissatisfied with the complacent attitude of surgery, though this was not now so great as formerly, when there was but little following-up. In his eleven years with the City of London Truss Society, he had treated 10,000 cases of hernia, and this had thrown light on two important aspects—the recurrence of hernia after operation, and the type of patient who, in the past, had been rejected as unsuitable for an operation. The matter was almost purely one of surgical technique, and he submitted that there was no hernia that could not be cured by operation. The complacency to which he had referred had been seriously upset a few years ago when Mr. Max Page reported a series of operations for hernia in policemen, a peculiarly fit and robust body of men, but which showed a recurrence-rate of 20 per cent. in direct hernia, 25 per cent. in indirect. This raised the question of an alternative method of operation. Some who were dissatisfied with the results might be tempted to try treatment by injection, but recent American contributions showed that, even with the most approved methods, at least 8–12 injections, at weekly intervals, were needed in each case. It was essential that during the whole of this time the hernia should be completely controlled by a truss, which meant that cases in which this was impossible were excluded. Even then the recurrence-rate after injection treatment was 8 per cent. It was difficult at present, therefore, to accept this method as a substitute for operation.

The causes of failure, Mr. Keynes went on, included failure of asepsis and of hæmostasis, which were elementary faults in technique, and their remedy was plain. On the more serious side, there was the mistake either of doing too much, or of doing too little. Both, in his view, had their origin in an over-standardisation of the method in common use. Another important factor was incomplete diagnosis before the operation was undertaken of the type of hernia in a given case. The discussion might reveal shortcomings in the Bassini operation, for so long the chief method. A pupil of Bassini had recently complained that the operation had been unduly abused, when in fact it had been very often inaccurately performed. Despite this, Mr. Keynes considered that it was unsuitable for a large group of cases, which included infants, children, and young adults, since it did too much. In many of these the essential was to remove the hernial sac, and the less the normal musculature was interfered with the better; unnecessary sutures through the internal oblique would only impair its function, and in many cases that muscle was unaffected.

Doing too little was bound up with making an incomplete diagnosis, chiefly in failing to detect direct inguinal hernia. His method was to incise the internal oblique and the rectus sheath, providing a flap that, when turned down, exposed the rectus muscle and covering the area through which the direct hernia was coming. Being no longer confined, the outer fibres of the rectus could be approximated to the inguinal ligament. He was not content merely with catgut suturing in this plastic procedure; it was important to take a strip of fascia from the edge of the upper flap of the external oblique, leaving it attached at the pubic spine, thus using it as a living suture. This allowed complete approximation of the flap that had been turned down from the pubic spine to the deep inguinal ring, and provided a new floor for the whole inguinal canal. That was only the first step towards success in almost every type of hernia.

For larger direct hernias, and for large indirect hernias, he thought a cure could practically always be obtained by using a more elaborate technique, such as that popularised by Gallie of Toronto. One series of 45 cases in which he had used a graft from the fascia lata gave no recurrences, and in another 33 cases, all extreme, with Gallie's technique there were only two recurrences (both being in the same patient). For some years he himself had been using a strip of fascia from the external oblique aponeurosis instead of catgut.

As to anæsthesia, many patients with hernia had chronic bronchitis with emphysema; they therefore coughed a good deal, and were liable to cough through catgut sutures. This rendered living sutures all the more necessary. Ether should be avoided, and even spinal anæsthesia could cause anxiety. He preferred local anæsthesia, though taking a strip from the thigh might be somewhat difficult. Satisfactory results could be maintained, Mr. Keynes concluded, only by having a large repertory and making a special case of each patient. Practically no case should be rejected as unsuitable for operation.

Mr. W. I. CUMBERLIDGE (Leicester) said that a comparison of results in a provincial town with those in London would be instructive. Leicester was a compact area, and the Royal Infirmary was the only large hospital there, so that patients whose condition recurred or who needed further treatment did not go elsewhere, but came back to the same institution, and usually to the same surgeon. In the last 4½ years 1345 operations had been performed for uncomplicated inguinal hernia with 9 deaths. Omitting a month-old child who had apical pneumonia, the mortality was thus 0·6 per cent. In 5 of the fatal cases the only pathological finding was ascending pyelonephritis, there having been no previous hint of such a condition. He had been performing the Bassini operation, when repair of the inguinal canal was required, for thirty years and he believed it to be the most stereotyped in surgery. Ten years ago he began to use the fascial suture for all direct, and old indirect hernias, and his confidence in that had steadily increased. The placing of the first suture he regarded as the most important step in the operation. A questionnaire had been sent out to a large number of operated cases, and of 594 cases who replied, a satisfactory answer had been received from 517, or 87 per cent.

Mr. W. H. OGILVIE said he feared that the operation for inguinal hernia was often looked upon as a simple one, which could be left for a junior to carry out when his chief had gone to supper; yet it might well be the most difficult in surgery, and it should always be regarded as important since it was the means of returning an otherwise healthy man to work and full function. The inguinal canal was of extraordinary complexity, and the technique necessary for its repair was often a delicate one, but it should

lead to a cure-rate of nearly 100 per cent.; even colossal hernia in old men of poor physique could be cured by operation of the appropriate type. Failures, then, must be due either to the operations being done by the wrong people, or to the selection of a wrong procedure. The anatomy of the living was a corollary to the pathology of the living, but not enough attention was paid to it in modern surgery. The inguinal canal was really a sphincter, and when it contained a hernia the surgeon must decide whether that sphincter was competent or incompetent. He must first remove the sac, but leave the muscular defences as little damaged as possible. Secondly, he must so reconstruct the canal that the weakened muscles were spared a task with which they could not adequately cope. Bassini's operation was rampant almost everywhere. Yet he quite agreed that for early hernias the method was unnecessary. The conjoint and cremaster muscles could not be trusted to do their job if they were tied down and strangled in a row of stitches. He pleaded for the abolition of the Bassini as a standard operation, for then surgeons would be forced to do either less or more in these hernia cases: less in hernias with undamaged muscle, more in hernias with muscular failure. Treatment aimed at either restitution or reconstruction, and there was no sphere for half-hearted interference.

Mr. C. C. HOLMAN (Northampton) said he had done 42 operations for inguinal hernia in which he had removed the sac, and in some of those cases he had supplemented this by overlapping the aponeurosis of the external oblique. Of 38 cases which he had followed up there had been 4 recurrences. Later he had selected his cases; if the hernia was small and the patient young, he contented himself with dealing with the sac; in others he added some plastic procedure. He followed up 75 of these after two years, and there were 5 recurrences among them, 4 of which had had simple removal of the sac.

Mr. A. K. HENRY (formerly of Cairo) spoke of a method he used of extraperitoneal approach for operating on uncomplicated hernia, following the practice of Sir Lenthal Cheatle. In Egypt bilateral ureteric lesions were very common, hence he was very familiar with the mid-line extraperitoneal approach. For hernia operations there had to be relaxation of the abdominal wall, and the spermatic cord must be kept on the stretch.

Mr. PHILIP TURNER said his own definition of an uncomplicated inguinal hernia was a small hernia in a child or young patient, without any stretching of the muscles. His impression was that in such cases all one had to do was to remove the sac, and this should be done with a minimum of damage to the normal structures; one of the secrets of success was to attend to the opening in the fascia transversalis. He agreed with all that had been said about Bassini's operation; it had become standardised and he did not think patients for it were usually selected in the right way.

Prof. A. W. SHEEN (Cardiff) said he taught students that in operations for hernia it must be "the sac, the whole sac, and nothing but the sac." He welcomed the remarks of Mr. Henry. One could not get to the sac without cutting through the structures in front of it, and one of them was the internal oblique muscle. During the war he saw many cases of recurrence of hernia, and they were largely due to the whole sac not having been removed; this was a greater factor than sepsis. He was quite sure that muscle would unite to fascia.

Prof. LAMBERT ROGERS (Cardiff) said all his instincts were against mutilating the sphincter in a healthy young person. He thought that not only should the sac be removed, but also the dimple left should be divided, as was done by Kocher, by turning the flap through the musculature.

Mr. PHILIP MITCHINER considered there were only two operations for hernia. One was aimed at interfering as little as possible, simply removing the sac as thoroughly but as gently as possible, and leaving the natural muscular mechanism of the inguinal region to prevent a recurrence. The other was for cases in which the musculature had become lax and atrophied, and here he considered that a fascial graft offered the only adequate means of curing the hernia, after the sac had been removed.

Mr. C. H. S. FRANKAU remarked that whatever means of suturing was adopted, it was of ultimate importance thoroughly to clean the tissues it was proposed to suture. He had seen people doing complicated sutures with blobs of fat adhering to the surfaces to be joined. If one took the conjoint tendon and Poupart's ligament and cleared away all obstruction, they would not only join well, but would "stay put."—Mr. E. T. C. MILLIGAN spoke of successful use of filligrees. This method was condemned mostly by those who had learned to do so from their teachers, not because of what they had themselves seen. But he agreed that the living suture gave better results, and recurrences after this were seldom seen.—Mr. M. F. NICHOLLS said he felt curious as to what happened in infants with hernia whose condition was said to have been cured by the wearing of a simple truss, or had been cured by the passage of time. It was his impression that these were the cases which came to the surgeon at between 16 and 20 years of age.—Mr. DELISLE GRAY from his own experience said that he had no doubt that patients could be cured by the injection method.—Mr. LLOYD WILLIAMSON advocated the use of the fasciatome, which, he said, saved valuable time in the operation.—Mr. W. M. MCCULLAGH questioned whether it was necessary always to remove the sac. In gynæcological operations he had seen inguinal hernia treated by dividing the sac at its neck, suturing it, and leaving the portion in the canal where it was, without disturbing it.

The PRESIDENT thought Bassini's operation did not deserve all the condemnation it had had in this discussion. That surgeon's record was a very great one, and no other operation had yielded such good results all over the world. But the operation should only be done by those who believed in it. Many of the failures were due to bad technique and he had been surprised how often surgical canons had been ignored. The fascia lata method was an important addition to the surgeon's armamentarium.

SECTIONS OF THERAPEUTICS AND MEDICINE

AT a joint meeting of these sections held on Dec. 8th the chair was taken by Dr. DOROTHY HARE, president of the section of therapeutics and pharmacology.

Prof. A. ST. G. HUGGETT opened a discussion on

Therapeutic Methods of Arresting Hæmorrhage

Medicine, he said, used measures based on physiological or pharmacological principles; they fell into two main classes: prophylactic steps involving the removal of the primary cause where that was known; and therapeutic steps after bleeding had begun. Local types of urgent hæmorrhage were capillary,

venous, or arterial. Measures might be directed to restraint of the flow of fluid blood by lowering the pressure in the vessel, or to consolidating the blood at the site of leakage. Blood pressure in an artery was maintained by three main factors: the volume of the circulating blood, which did not usually vary much; the output from the heart; and the peripheral resistance. Output depended on inflow and that on venous pressure, and that in turn on venous inflow. This was maintained by the muscular and respiratory pumps. Suction in the thorax dilated thin-walled capillaries within it, and the descent of the diaphragm raised abdominal pressure and drew blood up into the chest. Every muscular contraction pressed blood into the capillaries and on into the veins. The aggregate effect of many muscles in exercise was even greater than the aggregate effect of respiration. The nutrition of the cardiac muscle was an important factor in the power of the heart, and, by Starling's law, the power was also increased by increased intracardiac pressure. So in exercise the blood pressure was forced up. Increase in rate alone did not greatly affect the pressure, but cardiac reflexes correlated the rise of venous pressure with heart rate. Peripheral resistance partly depended on viscosity, which did not vary much except after hæmorrhage, but the main factor in its maintenance was arterial contraction due to local and nervous stimuli: temperature and metabolites caused local contraction and the sympathetic nerves caused contraction from the vasomotor centre. The centre was excited by various afferent nervous stimuli and by local chemical factors.

To stop blood flow, therefore, all factors causing rise of pressure must be stopped. Rest was important; the less muscular activity and the less emotional stimuli the better. Abnormal relaxation might be required and obtained by giving morphine and other sedatives. Adrenaline produced local vasoconstriction by acting on the nerves at the site of hæmorrhage, but must not be allowed to exert its general pressor effect. Vasopressin acted on the plain muscle of the vessels, also producing local constriction. Consolidation could be encouraged by protein precipitants such as tannic acid, ferric salts, and alum. They produced no true clot, and were not very efficient. The subject of blood-clotting was overloaded both with theories and with names. The current hypothesis said that the essential change was the alteration of the protein fibrinogen to the gel fibrin by the action of an enzyme thrombin. This was present in blood as a zymogen, thrombogen—the nature of which had aroused much discussion; it was a globulin, and was altered to thrombin through the action of calcium ions and thrombokinase or cephalin, which was liberated by tissues. A deficiency or excess of calcium inhibited the change. A deficiency of any of the other three factors would delay the clotting. Each was known to be absent in certain diseases. Hæmophilia was probably related to the prothrombin which was so linked that the kinase could not activate it. The most potent therapeutic agents were thrombin-like materials—e.g., snake venom. Vipers, notably the Russell viper, contained thrombin. The ordinary hæmophilic's kinase could not act; therefore an active preformed agent was necessary. Thrombokinase could be prepared from any tissue—e.g., brain or muscle—and would be of use for other patients suffering from a deficiency of kinase. Agents to stop hæmorrhage might therefore be classed as: kinases; thrombins; mechanisms to produce increased thrombin or fibrinogen (this probably explained the value of protein and serum injections, but their action had never been fully explained); calcium; or physical means. Like all enzymes, the clotting enzymes could be encouraged by warmth and stopped by excessive heat. Boiling saline had its uses. They were also susceptible to changes in hydrogen-ion concentration, and excessive alkalinity stopped their action without solidifying the blood. Carbon dioxide inhalations would sometimes encourage clotting.

Dr. MAURICE DAVIDSON discussed the principles which should guide the physician in the conduct of a case. The treatment of hæmorrhage depended on its cause—a platitude which was worth repeating in view of the tendency to treat a symptom instead of the disease, especially at urgent and anxious moments. Correct conduct must be the outcome of scientific training and common sense. The epistaxis or hæmoptysis of hypertension or nephritis might be beneficial, but if excessive might need to be checked. The duty of the practitioner was threefold: he must decide the differential diagnosis, estimating the significance of the symptom in relation to the disease from which it was believed to arise; he must recapitulate in his mind the methods of treatment that he might use and consider their advantages and disadvantages; and he must try to assess the value of any proposed therapy in regard to all the circumstances of the individual patient and his needs.

Bleeding might come from the alimentary, respiratory, or genito-urinary tracts, or be due to hæmopoietic disorders or virulent bacterial infections. The commonest cause of hæmoptysis was pulmonary tuberculosis and the amount brought up varied enormously. Life was seldom lost through lack of appropriate treatment. A fatal hæmoptysis usually ended life before medical aid could be summoned. Empirically, large doses of ergot by the mouth seemed to work; more scientific and equally successful were injections of Hemoplastin intramuscularly and 10 per cent. calcium gluconate intravenously. Hæmoptysis due to pulmonary congestion in mitral stenosis was too often attributed to tuberculosis, and failure to deal with the underlying heart failure resulted. Bleeding due to other disease of the lung—cancer and bronchiectasis, for example—demanded attention to the cause. The hæmorrhage in these cases seldom called for specific symptomatic measures.

Treatment was both difficult and important when the blood came from the digestive tract. The problem must be regarded from the standpoint of fundamental principles. Life had been lost from failure to adopt surgical measures at the optimum moment, after due transfusions, and this fact should not be forgotten in enthusiasm for other methods of treatment. Transfusions were valuable for cases not to be submitted to surgery. Hæmaturia due to focal causes was treated by discovery and elimination of the focus by bacteriology and surgery. Menorrhagia and metrorrhagia not due to gross pelvic disease also needed collaboration, between physician and gynæcologist. Streptococcal infections might cause alarming and fatal hæmorrhage. Transfusion was invaluable, but had the disadvantage of occasional reactions, despite every care in grouping. He quoted a fatal case of streptococcal infection of the tonsils with bleeding everywhere.

Prof. A. E. NAISH, speaking on hæmophilia, assumed that his hearers had read the recent paper [1] from Sheffield. That the injection of a minute quantity of any substance into the veins should be able to diminish hæmorrhage without producing

[1] Timperley, W. A., Naish, A. E., and Clark, G. A.: THE LANCET, Nov. 14th, p. 1142.

intravascular clotting was so strange as to be incredible, yet it had been proved to be true. A leader in THE LANCET of Nov. 21st had referred to the variations in temperature which might make a 28 per cent. difference in the estimation of clotting-time, but as the work had been done under stringent working conditions in a centrally heated building, this objection fell to the ground. Even if the error had been as great as 28 per cent. it would not have affected the validity of the argument. In hæmophilia, clot might be present amidst free bleeding and therefore a small tube, easily blocked by a few strands of fibrin, was a poor index of the individual's power to bleed. Even if all effect on the clinical condition could be disproved the effect on the clotting-time had to be taken into account. Twenty-four teeth had been successfully extracted from a hæmophilic in a few months, and local applications had been of the slightest. Hæmophilia fluctuated remarkably, and it might have been that all these extractions had coincided with good periods, but in fact they had not done so in Case 4. One patient had oozed blood from the puncture spots of old injections.

The work, said Prof. Naish, had not reached a stage at which its theoretical basis could be adequately discussed. It had arisen from a study of the effect of ions on the water-binding power of colloid states, and on the physical state of proteins in solution. Egg-white had been chosen as an easily obtainable sterile source of protein. The potassium salts, especially bromides, increased the solubility of proteins quantitatively. This had been tried on blood, and the result had been a non-retractile gel which had no appearance of fibrin microscopically and which became liquid again on vigorous shaking. The two things necessary to stop bleeding had therefore appeared to be fibrin and a gel. Substance No. 1 in the paper was an ovomucoid protein, as found in ovarian cysts and egg-white. It had been injected into all sorts and kinds of patients without producing protein shock. Substance No. 2 had been sought in an attempt to eliminate the protein factor; it did not give the biuret reaction and was not a phospholipide. No. 3 was a mucic acid derivative.

The PRESIDENT added a last chapter to the clinical history of one of the cases reported. The patient had had injections at ten-day intervals regularly. During November he had had an acute attack of pain in the hip. The preparation had appeared to act as a truly curative substance.

Dr. J. D. CAMBROOK spoke of dental extractions under the influence of snake venom: only two patients so treated had required transfusion. The coagulation time could be reduced from half an hour to half a minute, and the venom could also be used as a local styptic. More recent preparations, however, had given inferior results, the cause of which was being sought. The results of the new injection treatment were extremely good. A tight bandage did not stop a hæmophilic from bleeding; he just went on bleeding into his tissues.

Dr. GEORGE GRAHAM asked whether any other change in the blood had been found in those patients who oozed from their punctures, for this was very unusual. He confirmed the value of snake venom. He asked whether splenectomy would have been of value in Dr. Davidson's fatal case and whether the platelet count and bleeding time had been recorded.—Prof. NAISH said there had been bleeding from punctures in one case only.

STERILISATION OF SURGICAL DRESSINGS BY HEAT

IN this country the sterilisation of dressings for surgical use is most often performed in an autoclave of the vacuum type. The heat generated in the materials is mainly produced by condensation of steam on the fibres with liberation of its specific heat of evaporation, so that it is of the first importance to know that any particular form of packing used does not prevent steam penetrating throughout the dressings. At the end of the period of sterilisation the steam is evacuated, the condensed water is rapidly evaporated by the creation of a partial vacuum, and the dressings are then dried by an influx of hot air. In any investigation of the efficiency of the process it is clearly not enough to register the maximum temperature attained in the autoclave; the time factor and the whole cycle of operation must be considered. The possibility of dry sterilisation has been more or less discountenanced in this country, although it is used to some extent on the Continent.

R. Maxwell Savage [1] has recently published the results of his investigation of heat penetration into surgical dressings. He decided that temperature records could be made complete only by using some form of thermocouple. In his experiments he has used copper-eureka thermocouples embedded in the centre of the dressing, which were placed as nearly as possible in the centre of the autoclave. He studied temperature changes in three of the types of dressing sent out by a commercial firm—viz., 6-yard rolls of gauze; field dressings consisting of gauze and bandage, measuring 2¼ in. × 3 in. × 1¼ in., wrapped in parchment, and very tightly packed; and an accouchement sheet consisting of a layer of cotton-wool covered with gauze weighing about a pound. In each case the temperature record was compared with that obtained from a second thermocouple embedded in an unwrapped dressing (or even lying on the surface of the dressing) in an exposed position near the wall of the autoclave. The maximum temperature was always reached first in the exposed thermocouple, but the difference was only a minute in the 6-yard rolls of gauze, two minutes in the field dressings, and ten minutes in the accouchement sheet. In all cases a temperature of 120°C. was maintained in the centre of the sealed package for at least 16 minutes, and this passes the required minimum by a substantial margin. The conclusion is that the efficiency of steam penetration and heating is not affected by tight packing, by the size of the packages, by their position in the steriliser, or by sealing and wrapping.

A cotton dressing consists of fibres and an atmosphere. From the temperatures and pressures recorded during sterilisation, Savage concludes that some superheating of the steam in the atmosphere occurs, but that the fibres themselves retain a coating of moisture to the end of the sterilising period. This is important, because it is believed that superheated steam has not the same sterilising power as saturated steam. Admission of air is considered to interfere with steam sterilisation, hence the preliminary partial vacuum produced before the admission of the steam. Savage has conducted a series of experiments with dry oven sterilisation, the results of which suggest that the hygroscopic moisture, contained in the outer layers of the dressing, by its evaporation is enough to displace all air in a closed package that is not hermetically sealed. Heating of the centre of the package is then at least partially effected by condensation of this steam. The atmosphere of the cotton probably does not consist of air but of superheated steam. Savage has also demonstrated that bacteria are killed under the conditions obtainable. He concludes that in cotton packages steam penetrates almost instantly even when the packages are wrapped and sealed, and that efficient dry sterilisation in an electric oven is a practical possibility.

[1] Quart. Jour. Pharm. and Pharmacol., 1936, ix., 366.

REVIEWS AND NOTICES OF BOOKS

The Practice of Medicine

By JONATHAN CAMPBELL MEAKINS, Professor of Medicine and Director of the Department of Medicine, McGill University. London: Henry Kimpton. 1936. Pp. 1343. 42*s*.

THIS book is written in a new and refreshing style, in which symptomatology and the underlying disturbances of function are given priority over disturbances of anatomical structure. The worth of the method can easily be tested in the section on diseases of the lungs; the description of emphysema, for example, goes into all aspects of the pathological physiology of the disease. Prof. Meakins points out how the absolute diagnosis by means of spirometer tracings gives not only a qualitative, but also a quantitative estimate of the degree of loss of elasticity. This stands out in contrast to the dull anatomical approach of the average text-book, and is a joy to read. The same remark applies to sections such as dyspnœa, cyanosis, functional respiratory disorders, and congestive heart failure. There are chapters dealing with diseases of nutrition, metabolism and the ductless glands, and diseases due to chemicals, drugs, and allergy. Emphasis is placed in the introduction upon proper history taking and the correct approach to the patient, and the author expresses a hope that his work will be a real guide to the practice of medicine and not merely a description of individual diseases. That the book is up to date is seen in such sections as agranulocytosis, regional ileitis, and basophilism, but some liberty has been taken with the names of authors of medical classics. For example, Henoch's purpura is renamed Hanot's purpura, Gee's disease becomes Guy's disease, and Simmonds is called Simmond.

The type is clear with bold subheadings, a bibliography is appended to each chapter, and the index is excellent. The illustrations comprise 35 in colour and 370 in black and white, many of the latter being X ray prints. They are excellent but the choice strikes us at times as a little odd—e.g., the man with traumatic asphyxia and another with a congenital aneurysm of the external ear. Foot-and-mouth disease has two coloured plates, one showing vesicles on the lip and the other lesions on the dorsum of the hand, although authentic cases in man are very rare indeed. A case with such lesions on the hands can hardly be accepted without experimental evidence confirming the diagnosis; direct infections in laboratory workers, as in guinea-pigs, have led to skin lesions confined to the palms and soles. The illustration of a man with congestive heart failure, jaundiced over the thorax and head above the line of œdema, is a record of exceptional experience which carries with it a risk that his readers may see clinical medicine in a false perspective. The risk is enhanced by a certain unfair discrimination in the choice of subjects. Myelomatosis is probably ten times more common than osteopetrosis or lipoid granulomatosis, yet the latter diseases have detailed descriptions with ten illustrations, whereas myelomatosis is not even described.

We feel sure this book will be in great demand, and that it will be more useful amongst those already well acquainted with clinical medicine than amongst beginners. Prof. Meakins, as pioneer of the enlightened method which tackles symptoms and signs from the point of view of the disturbances of function they indicate, has taken a big step in the right direction.

Short History of Tuberculosis

By G. NORMAN MEACHEN, M.D., M.R.C.P., Tuberculosis Officer, Southend-on-Sea. London: John Bale, Sons and Danielsson Ltd. 1936. Pp. 105. 3*s*. 6*d*.

THIS book contains in concise form an outline of the development of our knowledge about tuberculosis from the earliest to the most modern times. After a survey of ancient and medieval history the evolution of medical treatment is described, due credit being given to the pioneer work of Bodington whose views on open air were set out at the time in these columns (THE LANCET, 1839-40, ii., 575) although regarded as "very crude ideas and unsupported statements." Following chapters deal with bacteriology, pathological anatomy, physical signs, collapse therapy, and finally the evolution of the control of tuberculosis and the progress of education and research. Under each subject the writer briefly reviews its historical development, ending with the most widely accepted present-day theories.

Although a vast amount of fact has been condensed into a small space, Dr. Meachen has succeeded in making his book both readable and interesting, not only for the medical profession, but for others who are interested in the problem of tuberculosis.

The True Nature of Viruses

By W. M. CROFTON, M.D., Director of the Antigen Laboratory; late Lecturer in Special Pathology, University College, Dublin. London: John Bale, Sons and Danielsson Ltd. 1936. Pp. 139. 15*s*.

THIS monograph presents Dr. Crofton's views on the nature of filtrable viruses. He finds himself at variance with those who have made a study of viruses and showers abuse on them for their orthodox views. To tilt at orthodoxy is often to perform a useful service, but the weapons used by the author are so unsubstantial as to deprive the book of even this value.

A Textbook of General Surgery

By WARREN H. COLE, M.D., F.A.C.S., Professor of Surgery, University of Illinois College of Medicine; and ROBERT ELMAN, M.D., Associate Professor of Surgery, Washington University. London: D. Appleton Century Company. 1936. Pp. 1031. 40*s*.

A Textbook of Surgery

Fourth edition. By JOHN HOMANS, M.D., Clinical Professor of Surgery, Harvard Medical School. Springfield, Illinois: Charles C. Thomas. 1936. Pp. 1267. $8.

(1) THE task of writing a text-book of surgery in one volume for present-day students is no easy one. Cole and Elman have fairly faced the problems in their new book, which is the outgrowth of a course of lectures given to junior students in the Washington University. An effort has been made to present rather more information about those matters with which every general practitioner should be familiar. But we have found, on perusal, the whole surgical field to be covered sufficiently for the student not to remain completely ignorant about any subject. The book has been written from a modern standpoint and in this respect has the advantage over an older book which has been revised. The freshness of outlook is very attractive. Another commendable feature

in an undergraduate text-book is the inclusion of a limited bibliography, so that the truly interested students can enter more deeply into their subject. A foreword has been written by Evarts Graham, who has contributed an excellent section on surgical diseases of the chest. An original feature is the description, under each illustration, of the clinical course of the diseases of the patients depicted. The book is convenient in size, well printed and illustrated. It can be recommended both to students and practitioners as reflecting modern views and trends in surgery.

(2) The second work noticed is the fourth edition of one which has been favourably reviewed in these columns. It was based upon the teaching of about twenty-five lecturers in the Harvard Medical School, integrated into one whole by a single author who has not shrunk from editing freely the material with which he was supplied. The book has been fully revised and sections added on plastic surgery and amputations. It is more comprehensive than the other volume just reviewed in its inclusion of the surgery of the ear and eye, and other specialties. It is another successful solution of the problem of a single-volume surgical text-book, and in its revised form is likely to be as popular as its predecessors. The line drawings with which it is illustrated form a pleasing feature.

Both books are good examples of the best in American surgical literature. It would be easy to criticise details but omissions and inclusions have received the attention of authors and compilers; taken as a whole, it may be said that excellent judgment has been exercised in the selection and compilation of such material as the undergraduate student needs.

Diagnostic Roentgenology

By ROSS GOLDEN, M.D., Editor, Professor of Radiology, the College of Physicians and Surgeons, Columbia University; Director of the Department of Radiology, Presbyterian Hospital, New York. London: Thomas Nelson and Sons. 1936. Pp. 867. $20.

FIFTEEN radiologists have coöperated in the production of this book. Such multiplicity of authors frequently results in omission and needless repetition but under the careful editorship of Dr. Golden these pitfalls have been avoided and the various sections are well coördinated. By selecting from the combined departments the authors have obtained a far better selection of films than would have been available to any one of them. So enormous has the science of radiology become that even in a book of this size the authors have found it necessary to refer the reader to special works; an adequate bibliography at the end of each section facilitates such reference. While each disease is briefly considered, the absence of verbosity has enabled the authors to pack a large amount of information into the allotted space. In the main, typical examples are described and the accompanying illustrations are well chosen. Photographs of the patient and pathological specimens serve to dispel any doubt the reader may have in accepting information not previously familiar to him. X ray photographs taken after an interval have similarly been used to render the statements convincing, affording as they do evidence that clinicians and pathologists have consulted together and that the diagnoses do not rest on mere speculation.

The book is on the loose-leaf system so that it can be kept up to date. The information supplied and the method of its presentation render it one of the best books yet published on diagnostic radiology. It will be appreciated alike by clinicians and radiologists.

St. Bartholomew's Hospital Reports

Vol. LXIX. London: John Murray. 1936. Pp. 413. 21*s*.

THE current number of these reports maintains the high standard of the recent numbers of the series. Obituary notices of Garrod, Herringham, Holmes Spicer, and Canti appear at the beginning of the volume, together with bibliographies of their writings. Girling Ball has contributed a narrative of the events which led up to the location of the medical college on the Charterhouse site. In a paper illustrated by excellent plates E. R. Cullinan presents a series of cases of recurrent idiopathic jaundice associated with subacute necrosis of the liver, but the discussion of their ætiology might with advantage have been expanded. R. Bodley Scott and A. H. Robb-Smith review the progressive hyperplasias of the reticulo-endothelial system, quoting illustrative cases, and append an excellent bibliography. Shorter papers follow from A. W. Franklin on non-tuberculous fibrosis of the lungs in children, R. T. Payne on the post-mortem findings after partial gastrectomy, H. J. Seddon on arthrodesis for tuberculosis of the hip in children, V. C. Thompson on the treatment of tuberculous cervical lymphadenitis, G. Simon on the gastro-duodenal mucosal pattern with graduated compression, and R. W. Raven on the results obtained in the treatment of perforated gastric and duodenal ulcers. W. G. Oakley's study of the erythrocyte sedimentation-rate in nephritis embodies a large amount of original work, and W. Warren deals with auricular flutter during the treatment of auricular fibrillation with quinidine. W. M. Levitt and R. F. Phillips record an investigation of the results of deep X ray therapy in malignant disease during the past twelve years; they formulate certain conclusions and predict a hopeful future for radiotherapy. The volume is well printed and illustrated.

REPORTS AND ANALYSES

BOURNVILLE PURE SOLUBLE COCOA

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Phosphorus as P_2O_5	0·87	,, ,,
Calcium as CaO	0·23	,, ,,
Iron, parts per million	80	
Fat (cocoa butter)	25·9	per cent.
Protein	20·5	,, ,,
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Calories per lb.	2129	

These figures show that the cocoa is pure and one of high quality. No artificial colouring matter could be detected, neither was there any evidence of finely comminuted shell.

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THE LANCET

LONDON: SATURDAY, DECEMBER 12, 1936

UNITY AMONG HOSPITALS

IT is now six years or so since the poor-law hospitals gained popular respect by transference to the care of the public health authorities. The effect on their character has been excellent, and everywhere there are signs of success in raising their standards. But the process of "changing" the more backward servants of the community does not in itself ensure that the domestic arrangements as a whole are sound. If the rescued poor-law institution insists on doing the same jobs as the long-established voluntary hospital there will be times when neither is working to capacity, while important work remains undone. Recognising the need for planning the household tasks comprehensively, the Local Government Act of 1929 said that health authorities finding fresh work for their new protégés must consult a committee representing the voluntary hospitals of the area and their medical staffs. No obligation was placed on the old servants (the voluntary hospitals) to consult the new ones before planning their own activities, but the Minister of Health hoped that the procedure outlined would lead on to wider arrangements for the fullest consultation between the local authorities and the medical profession. He wanted the kind of coöperation that would prevent overlapping and allow the hospital services of each area, voluntary and municipal, to provide between them all that the public needs.

The hope thus expressed has been realised more fully in Manchester than anywhere else—partly no doubt because the poor-law hospitals there were always wisely and humanely administered. In Manchester negotiation between representative committees has been abandoned in favour of something much more effective—namely, a Joint Hospitals Advisory Board—and its first annual report[1] shows the sort of action that may be expected when collaboration between hospitals turns from theory into fact. By constitution the Board derives ten members, together with the medical officer of health, Dr. R. VEITCH CLARK, from the city council; while eight represent the voluntary hospitals' council, and five, including the chairman, Sir CHRISTOPHER NEEDHAM, are sent by the University. Though it is advisory in function the constituent bodies have agreed in general to accept its findings, on the understanding that hospitals affected by its proposals are invited to attend its meetings and make known their opinions. Its object is to unify the whole of the hospital services within the city, and it is concerned not only with development of hospital work and accommodation but also with the training of medical students, the prosecution of research, and the principles that underlie the appointment of medical and surgical staffs. Unification, it is insisted, must and can be attained without destroying the spirit of enterprise, in individuals and in single hospitals, that has been so conspicuous in voluntary hospital practice; and it is noteworthy that in the Manchester municipal hospital service the disadvantages of central control are already countered to some extent by throwing responsibility upon committees that serve only two or three institutions.

In its first year the Manchester Joint Hospitals Board has begun to tackle the reduction of waiting-lists and has worked on such various problems as the price of milk to hospitals, precautions against air raids, and the treatment of fractures. From the point of view of the medical profession, however, its most significant actions have been those relating to the selection of consultants. In Manchester, as in some other cities, the municipal hospitals are now visited often enough to ensure that visiting physicians and surgeons are actually responsible for the diagnosis and treatment of all patients who are acutely ill. At other times of the day many of these part-time paid consultants are members of the staffs of voluntary hospitals; so that a large part of the personnel of the two kinds of hospitals is common to both. One advantage of this is that patients can sometimes be exchanged from one hospital to another, with continuity of care. More important, however, is the possibility that the principles governing selection of consultants may become the same for voluntary and municipal hospitals. One of the wise steps taken by the Joint Board has been to set up an independent advisory panel that will in future consider all applications for vacancies in the consultant service of the city and forward its recommendations to the public health committee. The suggestion is now made that this advisory panel should in future give similar assistance in the filling of appointments to the voluntary as well as the municipal hospitals. Once given a start the process of rationalisation sometimes goes ahead remarkably fast.

[1] Obtainable, free of charge, from the joint hon. secretaries of the Board, at the Town Hall, Manchester, 2.

PROFUSELY BLEEDING PEPTIC ULCERS

IN one section of a recent oration[1] to the Reading Pathological Society, Prof. J. A. RYLE returned to the problem of the treatment of acutely bleeding peptic ulcer. In the last few years widely varying estimates of the mortality of this condition have been published—anything from 1 per cent. to 25 per cent.—and those who have reported the larger figures have often wondered whether more radical methods of treatment, applied in appropriate cases, might not effect a net saving of life.

[1] Brit. Med. Jour., Nov. 28th, 1936, p. 1067.

The discussion[2] at the annual session of the American Medical Association last May is the latest example of growing dissatisfaction with present results. Prof. RYLE, however, leans strongly to conservative treatment, and bases his leaning largely on the low mortality which he has encountered in his own private practice (1·6 to 3 per cent.), supported by the verdict of a number of general practitioners circularised by Dr. A. F. HURST, and by figures of 5 per cent. or less reported in five out of sixteen hospital series which he quotes. Of those sixteen series the over-all mortality is well over 10 per cent., and Prof. RYLE is saying, in effect, to most of those hospitals: "Your mortality is regrettably high, but you need no radical methods to reduce it, for other people with the old conservative ones have done much better than you."

It is a difficult medicine to swallow, especially when the surgeons, in the persons of FINSTERER[3] and GORDON-TAYLOR,[4] have just lifted their voices again in favour of early operation for bleeding ulcer—the application of the primary surgical principle of tying the bleeding vessel. FINSTERER claims a 5 per cent. mortality in 59 cases operated on within 48 hours, but it seems widely agreed that FINSTERER's technical skill is exceptional. GORDON-TAYLOR sees the dangers of operation in partly exsanguinated patients charmed away by the magic of the drip transfusion method. It has yet to be decided, however, just how much difference the drip transfusion makes. There is no question that a dramatic change from pallid shock to red-faced well-being is produced in 48 hours by the introduction of several litres of blood, but no record has yet appeared of a large series of patients so transfused and subjected to radical gastric operations; it can scarcely be hoped that their mortality will fall much below 5 per cent., and the transfusion itself may not be entirely without danger. We would agree, therefore, with Prof. RYLE's protest against the wide adoption of surgical methods at the present stage.

At the same time the combination of operation with massive transfusion is such an improvement on operation alone or operation with a small transfusion, that it becomes more urgent than ever for the physician to learn to recognise the patients who, if they are medically treated, are likely to die. "A more careful study of prognosis is clearly necessary," and more necessary perhaps in the hospital patients than in the private ones. We wonder whether, in our hospital wards as a whole, the patient with an acutely bleeding peptic ulcer excites quite so much interest and attention, receives quite such close observation and careful nursing as, for example, the pregnant woman with signs of pre-eclamptic toxæmia. Every such case is a major problem, or may become one at any moment. Prof. RYLE's low mortality figures are meant not as a soothing but as a stimulating example.

[2] See Goldman, L.: Jour. Amer. Med. Assoc., Nov. 7th, 1936, p. 1537.
[3] THE LANCET, August 8th, 1936, p. 303.
[4] Ibid., 1935, ii., 811.

GEOGRAPHICAL DISTRIBUTION OF CANCER

ONE of the most striking contributions to the annual report of the British Empire Cancer Campaign for 1936[1] is a study of the regional distribution of cancer mortality in England and Wales, which has been carried out by Dr. PERCY STOCKS, medical statistical officer at the General Register Office. The full analysis relates to 522,251 deaths attributed to cancer in the decade 1921–30, a period when the accuracy of diagnosis and certification was undoubtedly much higher than in the earlier years of the century, and was also—an important point—becoming more uniform throughout the country. In the present report the study is limited to cancer of the œsophagus, stomach, intestines, rectum, liver, gall-bladder and pancreas, skin, lung, and breast, but similar data for other organs are being analysed. The distribution of mortality from cancer of these sites is shown both in maps and tables.

In comparing the recorded incidence of cancer in different areas three factors have to be taken into account—viz., the age- and sex-distribution of the populations at risk, and the proportions of the populations living in urban and rural areas. This is clearly necessary, for the risk of dying from cancer increases with age, differs for different sites between the sexes, and is usually higher in the urban areas than in the rural. A valid comparison between one area and another must therefore allow for demographic differences of these types; for example, it is useless to compare the crude death-rate of Norfolk, where 10·3 per cent. of the population are more than 65 years of age, with that of the West Riding, where only 6·6 per cent. are over this age. STOCKS's method has been to take the death-rates according to each site, for each age-group, for each sex, and for each group of administrative areas (county boroughs, other urban districts, and rural districts) in England and Wales as a whole, to apply these rates to the corresponding populations in each county, and thus to reach the deaths that would have been registered in each county if the experience of each of its sub-groups had been the same as in the corresponding sub-group in the country as a whole. These expected deaths he compares with the number actually recorded, expressing the latter as a percentage of the former, and testing whether the differences observed are more than are likely to be due to the play of chance. The effect of this standardisation is to reveal wide and very interesting differences. For instance cancer of the stomach shows two definite regions of high mortality, one extending from Wales to the north-west and extreme north of England, the other near to the Wash. The excess in some of the westerly counties of Wales is especially conspicuous, the worst example being Carnarvon where the recorded deaths both for males and females are just over double the expected numbers. Nearly every county in Wales gives ratios that

[1] The Report was reviewed in THE LANCET of Nov. 28th, p. 1294.

are consistently and significantly high. On the other hand these counties with high rates for the stomach show on the whole low rates for cancer of the œsophagus, though this inverse correlation is not apparent in the great towns. The high rate of gastric cancer in most of Wales is present at ages 25–65 as well as at the older ages where errors in diagnosis might well be a factor, and this leads STOCKS to conclude that the excess cannot be explained by peculiarities in death certification; while if it is regarded as a racial phenomenon the high rates in the adjoining counties of north-west England will still require a different explanation. He suggests that dietary habits may conceivably be involved or some indirect and at present obscure effects of the high rainfall in those areas; but the latter would hardly fit the second area of high mortality—namely, the Isle of Ely, the Holland division of Lincoln, and the Soke of Peterborough. Cancer of the intestines shows much less local variation than either cancer of the œsophagus or stomach, and bears no obvious relation to either. Cancer of the rectum and anus, which produces a mortality almost twice as great in males as in females, has a more definite regional distribution (the present study deals with males only). At ages over 65 its location is very similar to that of cancer of the œsophagus, the south-east quadrant of England being characterised by high mortality in each instance, so that there may be local factors common to these two forms.

Skin cancer shows very high ratios in the Holland division of Lincoln, Lancashire, Cornwall, Northumberland, Cardigan, Flint, and probably Anglesey, and significantly high figures are also found for Durham, the East and West Ridings, East Suffolk, and Monmouth. London, the Home Counties, and Carnarvon have remarkably low mortalities from this form of cancer. The explanation of this distribution will probably be found, STOCKS thinks, mainly in the distribution of industry, and he notes that most of the mining areas appear to have ratios above the average. The rapid increase in deaths attributed to cancer of the lung makes this site one of particular interest. The registered mortality clearly rises with urbanisation, but it is impossible to determine how far this is due to better facilities for diagnosis. From his detailed analysis STOCKS believes that the local distribution must be greatly influenced by lack of uniformity in diagnosis, but that it would be difficult to explain some of the contrasts noted only on those grounds. Cancer of the breast is relatively high in the urban areas, low in Wales and the north of England. Its local variation though less than that found for other sites is sufficient to require an explanation.

THE HUMAN FACTOR IN INDUSTRY

THE National Institute of Industrial Psychology was founded in 1921 as a voluntary organisation with the object of studying the human factor throughout occupational life and of spreading a knowledge of the practical results of such studies. Its first president was the late Earl of BALFOUR, succeeded in turn by Viscount D'ABERNON, Lord MACMILLAN, and the Earl of DUDLEY, who now occupies that position; vice-presidents of the Institute have been four chief officers of the Royal Society, Sir WILLIAM BRAGG and his three predecessors; Dr. C. S. MYERS, F.R.S., and Dr. G. H. MILES have served the Institute as principal and director since its foundation. The sixteenth annual report just issued [1] tells us that during the past year investigations have been carried out for 33 firms or companies, representing 23 different industries, while 1087 persons, three-quarters of whom were males, have received vocational or educational guidance. The Institute is not a profit-making concern. The subscriptions of its 1700 members and associates cover roughly the cost of the publications they receive, and out of an annual expenditure of £28,000 only about £21,000 is received back from concerns and individuals for services rendered, leaving uncovered an outgoing of about £7000 a year which has in the past largely been met by grants from Carnegie and Rockefeller funds, but more recently from the Balfour Memorial Fund which is now nearly exhausted. The Institute is recognised by London University for courses in industrial psychology, it has been widely consulted by education authorities at home and abroad, and it has in the past initiated a large amount of research work, including the scoring of intelligence tests, rhythm in motor activities, vocational guidance experiments, and the effect of alcohol on motor-drivers, all of which have led to results of practical value. The Institute is unique in its aims and work; no country possesses anything quite comparable, free as it is from State control and concerned primarily with the psychological and relevant physiological factors in the manifold aspects of occupational life. It is we fear a fact that without new sources of financial support the work of the Institute in its national and educational aspects is likely to be severely crippled, and in commending its work to the widest possible circle we need only recall the remark of ELTON MAYO that "the worker's attitude towards his work and towards his supervisor is more important than any other single factor in production," and that the Institute has shown remarkable insight and initiative in its work on this problem.

[1] The Human Factor. Annual Report Number. December, 1936.

LAMBETH HOSPITAL—To-day, Friday, Dec. 11th, at 3 P.M., Lord Horder is opening the new nurses' home at Lambeth Hospital. This is the largest general hospital under the control of the London County Council, and during the quarter ending Sept. 30th it had a daily average of 1064 in-patients. The new home, which is part of a scheme of modernisation, has cost nearly £59,000. It is a six-storey building and will have room for 206 members of the nursing staff. Each bedroom is fitted with a lavatory basin with hot and cold water, and a built-in wardrobe cupboard. For certain of the senior nurses a small sitting-room is provided adjoining the bedroom. Large separate sitting-rooms are also provided which can be thrown together by means of sliding doors for special occasions. The training school, containing a lecture theatre, demonstration room, and library, is at the eastern end of the building. On the upper floors are self-contained flats for the matron and the assistant medical superintendent. On the flat roof over part of the building there is provision for sun-bathing and physical exercises.

ANNOTATIONS

WHAT IS WRONG WITH MILK DISTRIBUTION?

MILK marketing boards are of recent creation, they have done excellent work, and their full utility cannot yet be assessed. All this is granted by the Milk Reorganisation Commission, but it is evident from its report[1] that the Commission is far from satisfied with many of the existing arrangements. Producers, apart from those in specially favoured markets, have received more for their milk, and the larger distributors have also benefited financially. But so far as consumers are concerned, the principal effect of the schemes, we are told, has been to raise retail prices throughout most of the country. This has arisen in two ways: in the first place through the higher wholesale prices which distributors have had to pay; and secondly through the fixing of minimum retail prices. More milk is produced, but the natural fall in its cost to the public has been prevented by the monopoly of the producers and their power to fix prices. This increased price has seriously limited consumption, and that despite the great improvement in the purchasing power of the public. Apart from cheap subsidised milk, the Commission can only point to a very slight rise in consumption. Rural consumers have suffered more even than urban consumers; as a rule they have to pay the full urban price for the milk produced at their very doors. It may be difficult or even impossible to obtain milk in the country at all because of reluctance on the part of the producer to take out a retailer's licence. Consider all that has been done to push milk as a staple article of diet: the efforts to stimulate consumption through the State subsidy, the milk in schools scheme, the stress on the nutritional value of milk, the propaganda of the National Milk Publicity Council. The Commission has to admit that the results, apart from directly subsidised milk, have been meagre. Dealing with figures not later than 1935, there was a very modest increase in the production of graded milks of improved quality.

What then does the Commission propose? The report contains certain definite administrative proposals. Its chief recommendation is the setting-up of a permanent milk commission of five members, each to serve for 5 years and to be eligible for re-election, appointed jointly by the Minister of Agriculture and the Secretary of State for Scotland. As the central authority for the industry it would advise the Government on questions of milk policy. Its task would be to develop the industry, to fix the prices to be paid to milk producers on the one hand and to the milk boards by the buyers on the other, and to control and supervise any State milk subsidy. The Commission frankly dislikes the present system under which producers' boards determine the buying price of milk by pooling the receipts from sales and dividing the total among producers according to their gallonage. The new permanent commissioners should fix prices at a level designed to secure the production of whatever volume of milk is required. This volume depends on the "normal" demand for liquid milk, on the provision of milk to assisted classes of consumers, on the extent of the subsidy to manufacturers. The price payable to producers should be sufficient to secure production, and will necessarily vary somewhat owing to local conditions and needs. The subsidy suggested is in the neighbourhood of an additional £3¾ million. At present the manufacture of milk products is conducted on an uneconomic basis, in the sense that the prices obtainable for the final product are insufficient to enable manufacturers to buy milk at a price which will cover the cost of its production. The balance is made up out of the price paid for milk used for consumption as a liquid. Put another way, consumers of the present high-priced liquid milk can obtain some consolation from the uneconomic price they pay for butter and cheese. The Commission would like the subsidy to be large enough to enable liquid milk prices to be relieved from their part payment for the manufactured article. The wholesale price of liquid milk could then be lowered and the retail price would fall. The subsidy could also be used to enable milk to be sold to selected classes of consumers at reduced prices. The wholesale price of liquid milk—i.e., the price paid by the distributor—should be fixed at such a level that the income from its sale, plus the income from the sale of manufacturing milk plus the grants in respect of manufacturing milk and of "assisted price" milk, will be sufficient to meet the payments due to producers. The Commission considers that improvements of method are possible both in production and in distribution, but does not elaborate its proposals under this head.

The report is mainly concerned with milk as a commercial product. It was not within the Commission's terms of reference to consider the public health aspect, but it is disappointing that the Commission fails to realise how intimately the safety of milk as a food is bound up with its increased production and use. Troubled as it is by the inadequate amount of milk drunk the Commission does not correlate this with the present want of confidence in its quality and safety. It visualises "accredited milk," a type regarded generally by the medical profession as unsafe, as the highest type available; it regards milk from tuberculin-tested cows as a pious hope for the future, and has nothing whatever to say about pasteurised milk. It is true that in an addendum to the report Sir John Orr, one of the commissioners, does lay more stress on this point, but the commissioners as a whole have not grasped, what every commercial advertiser knows, that you cannot push the sale of any article when there is grave doubt as to its safety. Whatever methods are adopted for marketing milk the position will remain unsatisfactory until a safe milk-supply is provided.

[1] Report of Reorganisation Commission for Great Britain. Ministry of Agriculture and Fisheries. Economic Series, No. 44. H.M. Stationery Office. 1s.

THE SURGICAL SIDE OF EPILEPSY

"THERE is only one physiological cause for epilepsy," writes Penfield,[1] "but there are many pathological causes. It is for the physician to search out the pathological cause and to treat each patient with discrimination. There is no panacea, no universal remedy." The physiological cause remains undiscovered, but great strides have been made during the last decade in correlating epilepsy with demonstrable intracranial lesions. Owing to his great interest in the subject, from the standpoint both of histology and therapeutics, Penfield has attracted much clinical material to his clinic at Montreal, and he is now able to give a critical review of the indications for and value of surgical intervention. He points out that careful preliminary study

[1] Penfield, W.: Arch. Neurol. and Psychiat., 1936, xxxvi., 449.

of each case is essential before any conclusion can be reached about the correct mode of treatment. Importance is rightly attached to the pattern of the attack, and if the history from the patient and witnesses is inadequate, then an attempt should be made to induce a typical fit while under observation in hospital. Every nurse should be trained to appreciate, and immediately register in writing, the precise course of events during a convulsion. Neurological examination, except in cases resulting from gross brain injury or tumour, often gives scant localising aid, and encephalography is almost always essential. This may demonstrate local cortical atrophy, or gross distortion of the ventricle, for scar tissue may cause a traction diverticulum. A tumour will be recognised by typical displacement of the ventricular system. Where craniotomy has been decided upon, then electrical stimulation of the exposed cortex will aid the surgeon both in locating the epileptogenic area and in indicating the limits of the Rolandic gyrus.

It is usually held that in a large proportion of cases of epilepsy no pathological cause is recognisable. This idea has lately been challenged by Bateman,[2] who claims to have detected organic abnormalities in the brains of 140 out of 142 cases diagnosed as idiopathic epilepsy. Bateman makes a significant distinction between the disease as it arises before and after puberty; before puberty, he says, it is nearly always associated with imperfect development of the frontal lobe, whereas after puberty it may be attributable to a variety of lesions, including abnormalities in the ventricles, meninges, pacchionian bodies, and blood-vessels. Walker,[3] who has studied 100 patients with major epilepsy beginning in adult life, is able to point to a similar variety: he found neurosyphilis in 15, hypertension (over 150 mm. Hg systolic) and arterio-sclerosis in 14, effects of trauma in 4, and tumour of the brain in 16. His series bears out the statement that, where epilepsy begins in adult life, a cerebral tumour is most often found to be the cause. In this connexion it is interesting to compare the incidence of epileptiform seizures in a series of supratentorial tumours from the Montreal clinic (71 per cent.) with that of other clinics; Sargent reported an incidence of 30 per cent. As Penfield says, this may be due to the attraction to the centre of a preponderating number with a history of convulsive seizures. It is surprising to learn that the incidence of fits in cases of meningioma—essentially a cortical tumour—was 71 per cent., and of astrocytoma, 84 per cent. Unfortunately the assumption, that if a tumour giving rise to epilepsy is removed then the fits do not recur, is unjustified, and it may be responsible for grave disappointment to the patient and relatives. Where the tumour removed was a meningioma, the seizures ceased in 42 per cent. of the survivors, but the corresponding figure for astrocytoma was only 13 per cent. Several interesting cases are reported in which epilepsy was deemed secondary to a subdural collection of fluid. The cause of this exudation is not clear, but drainage of the fluid appeared beneficial.

Perhaps the chief interest in Penfield's paper lies in his summary of results of operation for post-traumatic epilepsy. After compound fracture of the skull, a dense scar may bind brain and dura together, often with considerable distortion of the neighbouring wall of the ventricle. Closed injuries may result in local cortical atrophy, and a healing of cerebral abscess may also bring about the formation of a meningocerebral cicatrix responsible for epilepsy. Total excision of the scarred areas resulted in cure in 46 per cent. of cases, with an operative mortality of only 2·6 per cent. Moreover, such an operation, when performed by an expert, leaves no serious physical disability. On the other hand, former sufferers must always be considered potentially epileptic. "Cure," in this sense, implies freedom from attacks to date, up to periods of seven years.

[2] Bateman, F.: Ibid., p. 578; see THE LANCET, Nov. 7th, p. 1103.
[3] Walker, A. E.: Arch. Internal Med., 1936, lviii., 250.

JAUNDICE AND LIVER NECROSIS

IN the last volume of the *Reports* of St. Bartholomew's Hospital Dr. E. R. Cullinan gives an interesting and well-illustrated account of 20 cases of apparently causeless jaundice in which after death the liver was found to be largely fibrosed with scattered nodules of hyperplastic liver cells. He calls the condition, and such is its usual name, "subacute necrosis"; but the terminology is unfortunate for while "necrosis" refers to the pathological change, "subacute" describes the clinical course of those cases where the original necrosis, no doubt always acute, does not involve so much liver substance that the patient dies in a few days with "acute yellow atrophy." The main and characteristic symptom is jaundice, often recurrent, associated with vague illness and gastric disturbance. The jaundice is very variable however in its time relations: it was the initial symptom in about half the author's cases, while in two it appeared only shortly before death; it may be transitory or it may last ten years, and it generally grows darker towards the end. Bile pigment and sometimes bile salts were present in the urine and in the early stages the stools were often clay coloured though they generally returned to normal later on. The liver was palpably enlarged in two-thirds of the cases and the spleen in about a third, and ascites often appeared a few weeks before death. The terminal symptoms of cholæmia came rather suddenly and lasted only two or three days. The variations in what seems to be a consistent clinical picture are well brought out in the case-histories which are given in fair detail. The final condition of the liver is also essentially uniform, though the distribution and details of the lesions are various enough to give a diversity of appearances. The organ is extensively fibrosed with scattered nodules of regenerated liver cells, and in nearly all the cases the author satisfied himself that further necrosis immediately preceded death. His interpretation of the process is that there is an attack of necrosis (with jaundice) which is essentially lobular in distribution. This is compensated for by regeneration of the surviving healthy cells, but it is not necessarily completely healed since the lobules tend to collapse and the growth of the regenerative nodules helps to disorganise the normal lobular arrangement. It may however be enough to carry the patient on in tolerable health if he is lucky enough not to have another attack. If he does, the new liver tissue is destroyed, it may be on a scale sufficient to cause death, or enough normal tissue may remain to allow further regeneration; and so on. Whether the final fatal issue is due to there being too few liver cells is a little uncertain: the regeneration nodules are out of place with regard to their blood-supplies and their bile-ducts, and the cumulative evidence is certainly to the effect that liver cells can function properly only if the normal architecture of the liver is preserved, for it is on this that the liver cells depend for their supplies of hepatic and portal blood and the

anastomosis of the two at the periphery of the lobule as well as for their efferent ducts. It is likely that gross disturbances of the normal arrangements are in the end necessarily fatal, even though there are plenty of live liver cells left. The cause or causes of the whole sequence is, Dr. Cullinan confesses, quite obscure, and in his cases he could not implicate any of the poisons which are known to lead to liver necrosis. It is possible that the ordinary attack of "catarrhal jaundice" without sequelæ represents a mild manifestation of the same condition and there is certainly some evidence that this is associated with degenerative changes in the liver cells. Evidently what is wanting is an accurate knowledge of what is going on in the liver at the beginning, which is what pathologists so often need.

EATING AND TASTING [1]

MANY of us eat without appreciation of what we eat; we may know what we like, but we less often know what is good for us; few people are well informed about their food, and some even think that to be so informed savours of greediness. Dr. Leipoldt's "Belly Book" is opportune at the present moment. In preliminary chapters dealing with the general principles of digestion and nutrition, with the physiology of taste, with the food requirements as determined by age and environment, and with the effects of fasting and overfeeding, he makes a comprehensive review of the most important facts concerning the physiology and pathology of nutrition. In succeeding chapters he writes with learning and imagination concerning the selection of food, the appreciation of food, the art of dining, and the virtues of the fine alcoholic drinks. Study of recent literature suggests that, from the nutritional point of view, the health of the public is threatened less than ever before by a shortage of essential raw materials, but suffers more by increasing ignorance as to the proper means of employing them, and often by the deliberate misuse of excellent primary material. Dr. Leipoldt's book might well serve as a nucleus of the growth of a revival in interest in the true and worthy enjoyment of food for its own sake.

ARCHITECTS AND ANÆSTHETISTS

A NUMBER of members of the Royal Institute of British Architects took part with the section of anæsthetists in the discussion last week on the ideal structure of an operating theatre opened by Mr. George Edwards at the Royal Society of Medicine. They were unanimous in welcoming a joint discussion, feeling that the hospital architect was apt to be insufficiently acquainted with medical needs, and, indeed, was scarcely aware of the anæsthetist at all. Mr. Edwards's desires were simple but comprehensive; he looked at the anæsthetic room, the theatre, and the rest of the hospital from the point of view of what is best for the patient who is just about to undergo operation or who has just undergone operation. For the latter he preferred a recovery room in close proximity to the theatre, but this preference was not shared by some who took part in the discussion. Mr. E. H. Rayner, Sc.D., superintendent of the electricity department of the National Physical Laboratory, spoke on the measures necessary for the avoidance of dangers from static spark, and showed how commonly electricity of this kind could be generated in the modern theatre and anæsthetic room. Air humidity of 65 per cent. was, he said, a source of safety. Sound absorbing walls came up for discussion, when the architects pointed out the difficulty of combining this requisite with surgical cleanliness. Otherwise it is only the restricted space, it seems, that prevents the architect from meeting the needs of the medical man. The colour scheme for theatres and for hospital interiors generally led to divergence of opinion, although the customary interior decoration was admitted to be depressing. Anæsthetists mentioned the dangers which arose from a wrong choice of colour for walls, gowns, and window blinds in theatre and anæsthetic room. Dr. H. Gainsborough deprecated elaborate installations of any kind since finality in judgment could not yet be reached and an expensive arrangement put in to-day might be superseded to-morrow. Simplicity and flexibility were the essential qualities; he would like medical men generally to make themselves more expert about hospital construction than they were at present. The president, Dr. Langton Hewer, told of the satisfaction which the pipe installation for gases in the new theatres had given at St. Bartholomew's Hospital.

EXOPHTHALMIC OPHTHALMOPLEGIA

Dr. Russell Brain [1] has lately put forward the view that the association of ophthalmoplegia with exophthalmos and thyrotoxicosis is a syndrome distinct from exophthalmic goitre, from which it differs in several important respects, notably in age- and sex-incidence and in the relative slightness of the general symptoms of thyrotoxicosis. In "exophthalmic ophthalmoplegia," as he has named it, the basal metabolic rate not uncommonly is normal, and this syndrome has been observed to develop and progress in a number of patients after subtotal thyroidectomy has rendered the basal metabolic rate subnormal. In the light of recent physiological studies Dr. Brain suggests that the ocular symptoms may be due to the action of the thyrotropic hormone of the pituitary and that even in exophthalmic goitre the exophthalmos may not be a symptom of the thyrotoxicosis. Observations by other workers lend some support to this view. Thomas and Woods [2] record 16 cases from the Johns Hopkins Hospital "which present progressively increasing exophthalmos even after thyroidectomy has brought about relief of all the other symptoms such as tachycardia, tremor, nervousness, and increased rate of metabolism." Ophthalmoplegia developed in 7 of these patients. The post-operative basal metabolic rate was normal in all but 3, 2 of whom had post-operative myxœdema with basal metabolic rates of −30 and −35 respectively, while the third had a basal metabolic rate of +36. Sections of the extra-ocular muscles from 3 patients showed histological changes similar to those which have previously been described—namely, infiltration with islands of round cells. The authors' most striking observation was made in one case in which, after enucleation of both eyes, the orbital contents continued to hypertrophy and finally bulged out between the eyelids. Thomas and Woods conclude that progressive exophthalmos can occur in the absence of clinical hyperthyroidism and that if the thyrotropic hormone is responsible it acts not on the smooth but on the striated muscles of the orbit.

[1] The Belly Book or Diners' Guide. By C. Louis Leipoldt, F.R.C.S. Eng., D.Litt. London: Williams and Norgate Ltd. 1936. Pp. 298. 7s. 6d.

[1] Brain, W. R.: Lond. Hosp. Gaz. (Clin. Supp.), 1936, xxxix., No. 6.

[2] Thomas, H. M., jun., and Woods, A. C.: Bull. Johns Hopkins Hosp., August, 1936, p. 99.

Mr. Stallard [3] has since reported a case of exophthalmic ophthalmoplegia with thyrotoxicosis which reacted in a striking manner to the thyrotropic hormone of the pituitary. The patient, a man of 31, presented the clinical picture described by Dr. Brain, with bilateral exophthalmos, more conspicuous on the left side than on the right, paresis of the left inferior rectus and inferior oblique muscles, and minimal general signs of thyrotoxicosis, the basal metabolic rate being −4. On three consecutive days 600 Organon units of thyrotropic hormone were injected. After each injection the basal metabolic rate rose, and it reached a maximum of +41 per cent. three days after the last injection. At the same time the exophthalmos increased a little, subsequently diminishing in the right eye; but three weeks later the left eye developed corneal ulceration and the exophthalmos progressively increased, necessitating excision of the globe. The extra-ocular muscles were found to be considerably enlarged and the inferior rectus showed the characteristic round-cell infiltration and fibrosis. In this case, therefore, the effect of the thyrotropic hormone was greatly to intensify the exophthalmos, and though at the same time it raised the basal metabolic rate the occurrence of a similar progressive exophthalmos in the presence of post-operative myxœdema seems to imply that hyperthyroidism played no part in this intensification. It is unlikely that human material will afford stronger evidence that the thyrotropic hormone is responsible for the exophthalmos and the ophthalmoplegia, though there are still obscurities in its mode of action. It seems probable, however, that the study of this rare syndrome will throw light upon the pathogenesis of exophthalmos and upon the nature of exophthalmic goitre.

THE MEDICAL DIRECTORY, 1937

FOR one reason or another the Medical Directory is one of the most closely read publications of the medical year. The directory for 1937 which reached us on Nov. 29th, 1936, has a particular claim to interest because for the first time within living memory the list of practitioners in the London section has practically ceased to grow. The increment is a mere 4 on last year's number, while for the last nine years it has been each year more than 100 a year. There has been no difference in the method of compilation, and the figures must be taken as very nearly statements of fact. It looks as though medicine has suddenly discovered the fact that the London of the postal area—for it is this London on which the directory list is based—has stopped growing. By a curious coincidence this section of the Medical Directory has been reset in type and format which makes it 54 pages shorter than the same section last year. The actual face of the type used is the same, and the extra room has been gained by diminishing the space between the lines (doing away with what printers call the beard), by broadening the column, and by diminishing the margin at top and bottom. This process of internal reorganisation began a year ago with the introductory part of the directory, and will doubtless extend year by year to the back cover. We think it will commend itself to readers, and there are many besides ourselves who hope that the space thus saved may lead to the reinsertion of the section of dental surgeons who have no directory of their own. The total increment of names in the 1937 list is 657, made up as follows. On the plus side: London, 4; provinces, 468; Wales, 17; Scotland, 2; abroad, 153; Services, 22. On the minus side: Ireland, 9. Those who do not find their names in the classified list should turn to the "late list" of names and changed addresses on pp. 2221–5. There are a few small but useful additions to the directory. The return of the list of medical Members of Parliament (p. xlvii.) is welcome and the new entry about the L.C.C. Laboratory Service (p. 406). In the table of contents, medical "periodicalls" appear also under the heading "journals" in order that they shall not be missed. This is the 93rd annual issue, and may be had from Messrs. J. and A. Churchill (now of 104, Gloucester-place, London, W.1) at the price of 36*s*.

[3] Stallard, H. B.: Brit. Jour. Ophthalmol., November, 1936, p. 612.

THE ATTACK ON THE ATOMIC NUCLEUS

AT the conclusion of the annual conference of the British Institute of Radiology, of which some report is given on another page, the seventeenth Mackenzie Davidson memorial lecture was given by Mr. J. D. Cockcroft, Ph.D., of the Cavendish Laboratory, Cambridge. Dr. Cockcroft chose a subject in which he has himself played a prominent part, for although the way in which the nucleus of an atom holds together is still a secret he and his fellow workers have been instrumental in finding ways of blowing it to pieces. In a delightful discourse, disarming in the simplicity of treatment, he showed the swing of action during our period of radio-active knowledge in trying to make the nucleus give way to external forces. Radio-activity revealed atomic instability, for the most part a property of elements of high atomic weight and therefore of some complexity, though potassium with its feeble radio-activity was something of an exception. When Rutherford showed that oxygen could be formed from nitrogen by bombarding the latter with alpha particles, the first successful assault upon the nucleus from without had been made; but, when atoms with more closely guarded nuclei than nitrogen were similarly attacked, the attacks were warded off by the strong electric fields barring the way. The only way to get over this was to produce particles more highly energised than alpha rays. This has been achieved by speeding up protons and deuterons; when these electrified particles are showered upon atoms, they are able, by virtue of their enormous energy, to penetrate through the defences of elements of quite high atomic weight. This done, they disturb the equilibrium of the nucleus, often with consequent disruption of the atom, and an unstable type of atom persists—artificial radio-activity is, in fact, just as real a thing as the natural product.

Dr. Cockcroft reminded his audience that the chance of nuclear encounters is very small; he could see little probability of these artificial products becoming of such practical importance in medicine as are the naturally radio-active bodies, although they might be of great scientific use. He referred to the work of von Hevessy who has shown how to trace the distribution of phosphorus through the body by the mixture with it of minute traces of radio-active phosphorus; the detection of this by physical means is several million times as delicate as the ordinary gravimetric methods of the chemist. Medicine has therefore begun to benefit from these experimental feats of the physicists, whose aim is to reveal the nature of the nucleus and its surroundings. To some it may appear strange that the way towards this

knowledge is to shatter the nucleus; perhaps a refinement in method will allow a gentler but no less sure approach.

SERUM TREATMENT OF SPORADIC MENINGOCOCCAL MENINGITIS

MENINGOCOCCAL meningitis in non-epidemic periods and areas is most often due to infection with strains of meningococci of the serological Group II. This group comprises the Types 2 and 4 of Gordon as well as other types, perhaps many, which possess serological relationship, but not complete identity, with Types 2 and 4 and with each other. In the basal meningitis of infants, which is the chief contributor to mortality from meningococcal meningitis in inter-epidemic periods, meningococci of Group II. are especially common. Serum therapy in infections with Group II. is often, and particularly in infants, much less successful than in infections with Group I., the usual cause of cerebro-spinal fever in epidemic form. It is possible that one reason, among others, for this is an inadequate amount of antibody for Group II. in the usual polyvalent anti-meningococcus therapeutic serum. The serum department of the Lister Institute has, therefore, prepared a special Group II. serum by immunising horses solely with Group II. strains recently isolated from sporadic cases in various parts of the country. This serum has been subjected to a concentration process in which a large proportion of the inactive protein is removed so that one volume of the concentrated serum is roughly equivalent in antibody content to three volumes of the original serum from which it was derived. The usual small quantity of tricresol has been added to the finished product. It is suggested that this serum, obtainable from Messrs. Allen and Hanburys Ltd., might be employed in the treatment of infants with meningococcal meningitis unless and until serological tests of the infecting strain have shown, as they will in a small minority of cases, that it belongs to Group I. Records are kept at the Ministry of Health of the serum treatment of meningococcal meningitis in every case in which information is available, and it is much to be desired that such information should be as complete as possible, since there is as yet no means of arriving at an assessment of the value of anti-meningococcus sera except the compilation of clinical findings. In reporting cases treated by concentrated anti-meningococcus serum, the actual quantity used, in cubic centimetres of the serum, should be stated and not the presumed equivalent amount of the natural serum.

LISTER'S HOUSE SURGEON

Dr. John Macfee, who died last Saturday at the age of 92 years, was house surgeon in 1864–65 at the Royal Infirmary in Glasgow. It was on August 12th, 1865, that a boy of 11 was admitted to the Infirmary after the wheel of an empty cart had passed over his left leg, breaking both the bones and causing a wound, 1½ inches long and ¾ inch broad, over the fracture into which a probe could be passed for some inches. Macfee, acting under Lister's instruction, dipped a piece of lint in liquefied phenol, laid it on the wound, and immobilised the limb with pasteboard splints, the dressing being left undisturbed for four days. When Lister then examined it there were some superficial sloughs caused by the phenol, but no signs of suppuration. The wound healed within six weeks and the boy's recovery was complete. Lister recorded this case in an article entitled "On a new method of treating compound fracture, abscess, &c.," which appeared at the time in our columns[1] and was reprinted[2] when the centenary of his birth was celebrated. It was at that time a portent for a dirty compound fracture to heal by first intention and Macfee was accessory to an act of historical interest. After completing his house-surgeoncy he left Glasgow for London, where he spent the remainder of his long life. His death severs what must be the last link between our time and the house surgeons of Lister's Glasgow days.

SINOGRAPHY

AT a meeting of the section of otology of the Royal Society of Medicine on Dec. 4th, with Dr. Douglas Guthrie in the chair, Dr. Paul Frenckner of Stockholm read a paper on sinography, a method of radiography in the diagnosis of sinus thrombosis. This method of investigation aims at determining the existence of an obstruction to the blood stream in the dural sinuses or in the jugular vein, and is accomplished by taking an X ray picture during the injection of a Röntgen-opaque substance into the sinuses. The technique is as follows: by means of specially made trepanning instruments the superior longitudinal sinus is exposed, and into this vessel a Röntgen-opaque substance is injected and, simultaneously, X ray photographs are taken. If there is any obstruction to the blood stream in any of the "evacuary" sinuses, the picture of the Röntgen-opaque substance shows where it is to be found. Anatomical variations and anomalies must be carefully taken into consideration in assessing the value of the radiograms. An objection to the procedure is that it involves exposure of a cranial sinus for the purpose of establishing the diagnosis of disease in another sinus. The commonest affection of a cranial sinus is infective thrombosis of a lateral sinus secondary to suppurative otitis, and here the diagnosis is usually sufficiently clear to warrant direct operative exploration of the diseased region. In rare cases, where there is bilateral aural suppuration, there may be a doubt as to which side is the cause of the symptoms.

THE following trustees have been appointed to administer Lord Nuffield's gift for medical research at Oxford: Mr. W. M. Goodenough, vice-chairman of Barclays Bank (chairman); Mr A. D. Lindsay, vice-chancellor of the University; Sir Farquhar Buzzard, regius professor of medicine; Prof. T. B. Johnston, dean of Guy's Hospital medical school; Mr. R. W. Thornton, chartered accountant; Mr. Douglas Veale, registrar of the University; Prof. Edward Mellanby, F.R.S., secretary of the Medical Research Council; Mr. Andrew Walsh, solicitor; Major R. S. Rowell, member of the Radcliffe Infirmary's board of guardians; and Mr. A. H. Wood, representing the Wingfield-Morris Orthopædic Hospital.

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[1] THE LANCET, 1867, i., 326.
[2] Ibid., 1927, i., 773.

LONDON HOSPITAL—The sum of £80,000 is wanted by this hospital for essential improvements, and a dinner was held at Claridge's Hotel on Dec. 3rd in support of the appeal when donations amounting to over £4000 were received. The chief items of expenditure are £25,000 for a domestic servants' hostel, £21,000 for an extension to the nurses' home, and £15,000 for the ear, nose, and throat wards. A sum of at least £42,000 must be collected before an effective start with work can be made. The hospital has already received an anonymous gift of £10,000 towards the appeal.

PROGNOSIS

A Series of Signed Articles contributed by invitation

CXXII
PROGNOSIS IN PLASTIC SURGERY

II*

ACQUIRED DEFECTS

ACQUIRED defects may be the result of trauma, of disease, or of the treatment of disease. In this latter category come defects created in the removal of disease by surgical means, and also those which sometimes follow the use of radium and X rays and such cauterising agencies as diathermy and carbon-dioxide snow. Trauma, however, is the commonest cause, and the amount of damage inflicted necessarily varies from minor abrasions to extensive loss of tissues, which if untreated will cause severe secondary defect.

Abrasions

Recent.—Recent abrasions are frequently dismissed as being of little importance. When they are acquired on the modern tarred road such an attitude may result in a scar of reasonable texture, but of very bad appearance on account of its dark pigmentation. Immediate efficient cleansing under anæsthesia with a silver wire or stiff bristle brush will avoid all such pigmentation.

Healed.—Tar pigmentation cannot as a rule be removed after the wound is healed without complete excision of the whole of the affected area. Since these areas are frequently extensive and often multiple, this may mean the utilisation of a graft—an operation which is out of all proportion to the magnitude of the original injury.

Wounds

Recent.—Immediate suture after careful débridement naturally offers the best prospect of a good scar. Only when sufficient time has elapsed to allow of gross infection is it desirable to allow healing to occur before undertaking secondary excision and resuture. As a rule healing is obtained within less than five days of the accident.

Healed.—When a wound has healed and has produced an unsightly scar, improvement can frequently be obtained by excision of the scar and accurate resuture. Keloidal tendencies can usually be minimised by the pre-operative and sometimes the post-operative use of X rays or radium.

In some situations it is found that really good results cannot be assured. On the face scars which cross the supraorbital ridge or the lower border of the mandible frequently tend to become depressed. Scars in the malar region have a similar tendency, though in this situation a horizontal scar is less likely to be troublesome than a vertical one. On the body a vertical scar near the midline seems prone to become keloidal. This is particularly true of the neck and chest, and the tendency appears to diminish as the scar lies nearer the pubes. On the limbs vertical scars tend to become wide, though not necessarily keloidal, whereas transverse scars are less likely to be so obvious.

Tissue Loss

Recent.—Extensive lacerations should be treated as emergencies. If accurate débridement is carried out, if all tissue of doubtful viability is removed, and if the resultant raw area is immediately provided with a new skin covering, then healing by first intention should be the rule. Replacement of skin flaps without any regard to the certainty of their survival cannot fail to result in infection. As a result tissue which otherwise would have survived will be lost, healing will be delayed for many weeks, and there will finally remain a mass of scar tissue which will require subsequent removal.

Burned surfaces unfortunately do not lend themselves to immediate repair, but with careful treatment it should be possible to prepare the burned area to receive a skin graft within two to three weeks of the injury. The primary necessity is to provide a new skin covering at the earliest possible moment in order to avoid cicatricial contracture. Subsequent intervention with a view to improving the cosmetic result is best left for at least six months, since spontaneous improvement occurs for at least this period.

Healed.—Healed tissue losses result in cicatricial contracture. On the face this may cause ectropion of lids or lips, or gross distortion of other structures. On the body or limbs it may cause limitation of joint movement, and the presence of cicatricial bands is frequently associated with areas of chronic ulceration. As a rule such a scar must be removed in its entirety, and all normal parts allowed to resume their correct positions. The resultant defect is then made good either by some form of free graft or by a pedicle flap brought in from a distant part.

A graft cut with a razor considerably thicker than the original Thiersch is that most frequently applicable to large defects. It is however subject to certain disadvantages. Firstly a certain proportion wrinkle and contract. No reason can be ascribed for this and a repetition of the operation may result in a good graft. Secondly, it seldom acquires a colour exactly comparable to that of the surrounding skin. It may remain yellowish-white, though occasionally it may become dark brown in colour. In certain situations such as the eyelid, or back and front of the hand, it may become quite normal in colour. The yellowish-white type of graft may be improved by tattooage.

The Wolfe or whole-thickness graft gives good colour and texture in a larger percentage than the razor graft, and shows little inclination to contract. Larger grafts are, however, prone to failure as in the case of thick razor grafts.

Finally, flaps or pedicles may be necessary. This method has the great advantage of enabling the surgeon to import subcutaneous tissue as well as skin. Defects in contour can thus be made good at the same time as the skin covering is provided. These flaps may remain the same colour as the donor area but as a rule they slowly acquire the characteristics of their new situation.

Fractures

Recent.—Fractures of facial bones are frequently associated with skin injury. As a rule both lesions can be dealt with at the same time. If however there is no skin lesion demanding immediate treatment, the accuracy of reposition of the bony fragments may be facilitated by waiting for a week or so to allow all swelling to subside. When this has occurred the position of the fragments will be more readily palpable and their replacement more exactly controlled.

* Part I. appeared last week.

Fractures of the mandible or of the maxilla should be dealt with as early as possible. There is no necessity to wait for the subsidence of swelling, since in most cases the occlusion of the teeth will afford the most accurate guide as to the accuracy of the reduction. In most of these fractures the coöperation of a dental surgeon is desirable.

Healed.—Neglected fractures of the nose frequently lead to some degree of nasal obstruction as well as to the cosmetic defect. Unless the nasal arch is replaced in its normal position it is seldom possible to restore and maintain the nasal septum in a central position. It is therefore desirable to undertake restoration to the normal as soon as possible. This is particularly so in fractures occurring before the completion of growth, since persistence of the displacement will result in an aggravation of the defects. Lesser degrees of nasal injury may be the cause of severe defect. For example, a nasal fracture may be associated with little displacement, but may be followed by an infected hæmatoma of the septum. This frequently results in severe deformity on account of the loss of support of the lower half of the nasal bridge.

When all sepsis has been eliminated, the bridge should be supported in its correct position by a bone or cartilage graft. This is of particular importance in children, since it appears that lack of tip support is frequently followed by failure of growth of the columella and alæ.

Neglected fractures of the malar zygomatic compound will result in persistence of some or all of the symptoms of this fracture, namely:

(1) Pain on mastication.

(2) Low level of the eye on the affected side with or without diplopia.

(3) Anæsthesia of the upper lip and anterior teeth on the affected side.

It is frequently possible to mobilise the fracture and replace it. If this is not desirable or possible, then the effects of the fracture on the eye may be ameliorated by building up the orbital support by bone or cartilage graft, and the loss of contour in the malar region may be disguised by a fat graft.

Neglected fractures of the mandible or maxilla are usually capable of mobilisation and reposition. If, however, a mandibular fracture has been complicated by infection and bone loss, then the whole dental occlusion has been disrupted. In this case a series of operations will possibly be necessary, having as their first aim the bridging of the defect by bone, and as the second disguise of any secondary defects which may have occurred.

Loss of Special Structures

The loss of nose, lips, ears, or other specialised structures, whether as the result of accident or disease, can usually be made good. As a rule these repairs must necessarily be carried out at the expense of some other part of the patient's anatomy. In the case of an ear loss it may be desirable to utilise the cartilage from another person as the basis for the reconstruction. This leads to less defect in the donor than would be imagined.

All of these reconstructive operations are as a rule a little slow, but it must be remembered that a new nose can be constructed in as short a time as three weeks. Complete reconstruction of (say) one side of the face, together with eyelids, must necessarily occupy considerably more time, although each operative stage is relatively short—say two to three weeks. Even though this type of work occupies valuable time and requires much patience, it is found that the patient is always coöperative. The prospect of being relieved of a deformity which precludes all social contacts is more than a sufficient incentive. Nor must it be forgotten that even a small physical lesion may be the cause of great mental distress. The removal of the lesion may be the means of avoiding or alleviating much of the chronic ill health which is associated with the abnormal sensitiveness from which these patients often suffer.

H. D. GILLIES, F.R.C.S.,
Plastic Surgeon to St. Bartholomew's Hospital.

RAINSFORD MOWLEM, M.B., F.R.C.S.,
Surgeon Specialist, Plastic Unit, L.C.C.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. G. R. McCowen, O.B.E., to *President* for course.

Surg. Lt.-Comdrs. A. J. Burden to *Pembroke* for R.N.B.; T. F. Crean to *Pembroke* for R.N. Hosp., Chatham; and J. G. Currie to *President* for course.

Surg. Lts. C. J. Mullen to *Resolution*; and B. M. O'Sullivan to *President* for course.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. R. H. Longmoor to be Surg. Lt.-Comdr.

Surg. Lt. W. E. Thomas to *Resolution*.

Proby. Surg. Lt. A. I. L. Maitland to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

The undermentioned appt. has been made in India:—

D.A.D.H.: Maj. J. N. Atkinson, R.A.M.C.

Maj. T. L. Henderson, R.A.M.C., has assumed the post of specialist in surgery at Bareilly.

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. S. D. Loxton to be Capt.

TERRITORIAL ARMY

The King has conferred the Efficiency Decoration upon the undermentioned Officers under the terms of the Royal Warrant dated Sept. 23rd, 1930: Lt.-Cols. W. H. Kerr and J. M. Chrystie; Majs. W. R. Watt and H. M. Holt.

ROYAL AIR FORCE

Squadron Leaders F. L. White to Central Medical Establishment, London; and B. W. Cross to Aircraft Depôt, Hinaidi, Iraq.

The undermentioned Flight Lts. are granted permanent commissions in that rank: F. W. P. Dixon, M.B.E., and C. R. Palfreyman.

Flight Lt. C. A. Lewis relinquishes his short service commission.

DEATHS IN THE SERVICES

Major-General Sir GEORGE DEANE BOURKE, who died on Monday in London at the age of 84, was born in Nova Scotia to Lieut.-Colonel T. J. Deane Bourke, who married the daughter of the Ven. Robert Willis, Archdeacon of Nova Scotia. He qualified L.R.C.P. and S.I. in 1873, and joined the R.A.M.C. in the following year, becoming colonel in 1903. He served with the Nile expedition 1884–85, in Burma 1889, and with the Chin Lushai expedition 1889–90 (dispatches and clasp). He became principal medical officer of the Western District 1903–08, and P.M.O., Irish Command, 1908–12. He was made a C.B. (mil.) in 1907, K.C.M.G. in 1917, and was hon. physician to the King from 1909 to 1912. Retiring in 1912, he went to the Balkans under the British Red Cross Society. During the European War he was re-employed as D.D.M.S. Scottish Command, and later as D.D.M.S. Aldershot Command. He married in 1883 Mary Morrow, daughter of John Stairs, formerly of Fairfield, Halifax, N.S., and has a son, Group Captain Ulick John Deane, C.M.G., R.A.F. (retd.).

SPECIAL ARTICLES

VITAMIN C AND JUVENILE RHEUMATISM

WITH SOME OBSERVATIONS ON THE

VITAMIN-C RESERVES IN SURGICAL TUBERCULOSIS*

BY M. A. ABBASY, M.B.

N. GRAY HILL, M.C., M.B. Lond., D.P.H.

AND

LESLIE J. HARRIS, Sc.D., D.Sc., Ph.D.

(From the Nutritional Laboratory, Medical Research Council and University of Cambridge, and from Queen Mary's Hospital for Children, Carshalton, Surrey)

A CORRELATION between the incidence of juvenile rheumatism and poverty has more than once led to the suspicion that some error of diet might be a causative factor in the disease. However, in the absence of any scientific evidence this view has received little notice and has failed to become part of the current recognised "medical teaching": it has remained but one among a multitude of alternative theories advanced from time to time as suggested explanations for the known social and environmental relations of the "rheumatic state"—e.g., the "damp" theory, the "allergy" theory, the "hygiene" theory, the "exposure" theory.[1 2]

But recently, in 1933–34, what may be termed the dietary view was brought strikingly to the fore when Rinehart and his co-workers [3] at San Francisco found that in experimental guinea-pigs a chronic partial deficiency of vitamin C, plus a superimposed infection, resulted in the appearance of pathological changes having nearly all the essential features of those found in rheumatic fever in human beings. They concluded that in human beings deficiency of vitamin C combined with an infection might in the same way account for the pathogenesis of the disease. To test this theory, Perry [4] at Bristol examined for vitamin-C reserves a group of 5 active and 6 quiescent cases of rheumatic heart disease, following the test-dose technique as described by Harris and Ray [5] (i.e., urinary excretion of vitamin C after administration of a test dose). Perry's main conclusion was that "vitamin-C deficiency is not an important factor in the causation of acute rheumatism"; at the same time however the finding is given that "mild degrees of this deficiency are not uncommon in rheumatic children."

As Perry's results seemed to us to need repeating on a more extensive scale, before conclusions could be obtained which might be relied upon as of statistical significance, we undertook a survey to embrace a very large number of children. To date, some 107 active rheumatic cases have been examined, some 86 convalescent cases, together with 64 controls, and 42 cases of surgical tuberculosis in the earlier stages of the disease, and 46 cases of quiescent surgical tuberculosis. As a result we have found a striking difference between the excretion of vitamin C by the rheumatic cases (active or convalescent) compared with the controls, while the results on surgical tuberculosis are also of interest, and may be studied alongside. Since this work was concluded a valuable paper by Sendroy and Schultz [6] has appeared having an object very similar to our own. While an analysis of their actual experimental results shows that in many respects these closely resemble our own, we would prefer to give an entirely different emphasis to our conclusions, since their main finding is that "applied to a comparison of patients with rheumatic fever and control subjects, the results of this method do not support the concept that a condition of ascorbic acid deficiency is a predisposing factor in the causation of this disease."

ARRANGEMENT OF EXPERIMENT

Conditions at the Queen Mary's Hospital for Children at Carshalton permitted of observations being made on large numbers of children, all of whom could be kept for long periods under observation and maintained under controlled conditions as to diet, &c. The children were under the clinical care of N. G. H., and the titrations on the urine were carried out by M. A. A.

Technique of urine tests.†—For the purpose of an investigation such as the present, in which the object was merely to obtain comparative results on the behaviour of large groups of individuals, it was not found necessary to carry out confirmatory "test dose" measurements on the entire series of children examined; it has already been shown (and is again apparent from the present work) that under ordinary circumstances the responses to such test doses are simply graded according to the "resting level" of excretion.[7] Quantitative data [7 8] were given in previous papers showing how this "resting level" of excretion varied when various given graded doses of vitamin C had been included in the past diet; it was found that when the diet contained the reputed bare "minimal optimum" dose of vitamin C (25 mg. for an adult of 10 st., equivalent to rather less than the juice of one fresh orange) the resulting excretion of vitamin C at equilibrium was approximately 13 mg. per day.[7 8] Hence it was argued that a steady excretion of less than 13 mg. per day (per 10 st. body-weight)—our "standard" level—raised the presumption that the past diet had contained less than the reputed minimal optimum dose of vitamin C. This standard of 13 mg. per day has been used as a kind of base-line for further work, including the present tests; and the numerous results on control cases to be recorded below provided further welcome evidence as to the validity of this figure. Whereas something like 75 per cent. of subjects of the voluntary hospital classes examined in our earlier tests [8] showed excretions below this standard (indicating the presumption of an inadequate diet), *all* the controls in the present series, known to have been on adequate diets for some time past, gave values above the standard. A proportion of the controls who were examined further by the test-dose procedure, 10 in number, were all likewise found to fulfil the other criterion laid down—namely, to give a response to the standard test dose (700 mg. per 10 st. body-weight) generally on the first day and certainly on the second day (see Fig. 2).

* This paper forms the subject of a communication made to the Biochemical Society on Oct. 17th, 1936 (abstract in "Chemistry and Industry," 1936, lv., 838).

† It does not seem necessary for the present purpose to cite in full the now extensive literature dealing with the excretion of the indophenol-reducing substance (vitamin C) in urine: for the earlier of the papers on the subject see Cohen, Gibbs, and Clark [6a], Euler and Klussmann [6b], Eekelen, Emmerie, Josephy, and Wolff [6c], Harris, Ray, and Ward [6d] Johnson and Zilva [6e], Harris and Ray.[5]

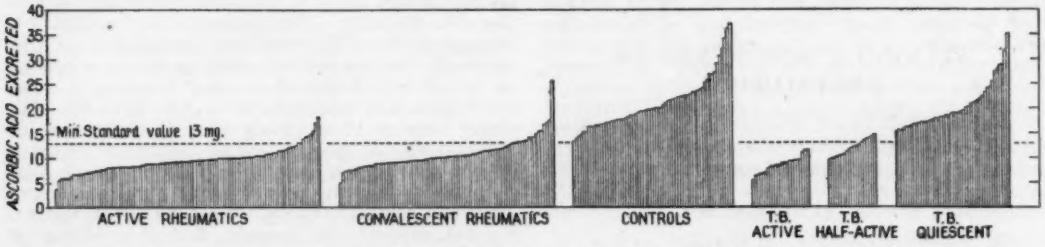

FIG. 1.—Comparison of the amounts of vitamin C excreted by active and convalescent rheumatics as compared with controls, and by active, "half active," and quiescent cases of surgical tuberculosis. (Ascorbic acid in mg. per day per 10 st. of body-weight.)

Children with subnormal "resting levels" gave a correspondingly diminished response to test doses.

Apart from a deficiency in the diet, the other principal factor known to cause a reduction in the excretion of the vitamin is the presence of pyrexia, infective conditions, or toxæmias. In such states the vitamin reserves appear as though they were being used up at a faster rate than normally, and indeed there is growing evidence that vitamin C is in fact an important factor in protecting against infection.

The increased liability to infection seen in the scorbutic or subscorbutic state was early emphasised, particularly by Hess,[9] and much such evidence, clinical and experimental, has been well reviewed by Mackay.[10] Lately a fresh connexion between vitamin C and infection has been reported in the influence of the vitamin in increasing the resistance to diphtheria toxin and in inactivating the toxin in vitro [11-17] or in exerting a possible "antitoxic" action in relation to other organisms.[18 19 20] The claim that deficiency of vitamin C causes a diminution in the complement titre [20 21] has been questioned.[22]

TABLE I

Summary of Results

—	Excretion of ascorbic acid, mg. per day (per 10 st. body-weight).				
	Lowest value observed.	Highest value observed.	Values characteristic of each group, as calculated from— (1) *Range* of middle third.	(2) *Mean* of middle third.	(3) Median (or average) value.
Controls ..	13·3	37·2	18·1–21·7	19·9	19·7 (20·9)
Rheumatics—					
Active ..	3·7	18·2	8·7–10·1	9·4	9·3 (9·6)
Convalescent	4·7	17·4	9·5–11·1	10·1	10·1 (10·6)
Surgical tuberculosis—					
Active ..	5·7	11·7	8·2– 9·1	8·6	8·6 (8·6)
Half-active .	9·6	14·8	10·7–12·5	11·7	11·9 (11·9)
Quiescent ..	15·2	35·0	17·7–20·1	18·9	18·9 (20·3)

TABLE II

Number of Cases found Below Standard in the Various Groups

—	Total examined.	Below standard.	
		Number.	Percentage of total.
Controls	64	0	0
Rheumatics—			
Active	107	98	92
Convalescent ..	86	71	83
Surgical tuberculosis—			
Active	23	23	100
Half-active ..	19	14	74
Quiescent	46	0	0

It is reasonable to argue therefore that when the excretion is found to be low, either the diet has been poor in the vitamin or else an infective condition has been present, in which the needs for the vitamin are probably increased and the body's stores presumably called upon and depleted to more than the usual degree. (Apart from infective conditions, a lowered excretion of vitamin C has been recorded also in certain mental disorders,[22a] and in several cases of Addison's disease which were recently examined.[22b] The latter finding is of special interest in view of the involvement of the suprarenal glands, which are known to be exceptionally richly endowed with the vitamin.[22c])

Analytical procedure.—The titrations were carried out as previously described.[7] The samples of urine were collected, with addition of acetic acid, in dark-coloured glass bottles, the night urine being analysed first thing in the morning and the daytime urine in the evening. Urines were collected and analysed generally on three consecutive days each week, and relatively little day-to-day variation was noted. In the actual estimation, which consists of a simple titration against 2:6-dichlorophenolindophenol, the main point to be stressed, as previously noted, is that the titration should be carried out rapidly.[8]

CASES EXAMINED

We have examined a group of 107 active rheumatic cases and 86 convalescent rheumatic cases. For controls, a group of 64 individuals was taken, receiving the same institutional diets.

Diets.—The dietary was a liberal one, and contained an ample supply of fruit, sufficient to bring the daily intake of vitamin C well above the "minimum standard" of 25 mg. per day per 10 st. body weight. All children over 3 st. in weight received a minimum of at least one orange per day, or those under 3 st. of half an orange per day: generally the intake is appreciably higher than this minimum, apples and bananas being included in the dietary from time to time. In addition, many of the active, and some of the convalescent, rheumatics received about 8–10 oz. daily of a "fruit drink" (containing five lemons or oranges in 4 pints).

In view of the considerations referred to above, individuals with pyrexia were excluded from the control group; the control subjects were mostly cases of congenital deformity or cases of debility well on the way to recovery. In order to compare with another infective condition, we have examined, further, a number of patients with surgical tuberculosis, of whom 23 were described as "active" cases, 19 were cases who had improved under treatment but had not yet reached the quiescent stage

and are here described as "half active," and 46 were "quiescent" cases.

Mode of expression of results.—In order to compare children of varying ages with adolescents and adults, the simplest procedure, which is sufficiently accurate for the present needs, seemed to be to reduce all values to a common basis of body-weight. On "good" normal diets, the *concentration* of vitamin C in the urine does not vary greatly, whereas the *total weight* passed per day of course increases with age, as does the volume of urine, the weight of food eaten, and the body-weight.

Diagnosis.—The term "juvenile rheumatism" is used to cover rheumatic fever, rheumatic heart disease, chorea, and allied conditions, generally regarded as being of a rheumatic nature. As all the subjects were children who had been admitted under the L.C.C. Rheumatic Scheme for further treatment at Carshalton, the diagnosis of rheumatism had been checked by several experts in turn, and the classification shown in our tables into the several categories, of "active," convalescent, &c., is that made by the medical officer in charge of the case by whom the progress of the disease is judged. Diagnosis of convalescence in the rheumatic cases is usually checked by tests of sedimentation-rate. It may be noted that the cases seen at Carshalton are not as a rule of the most severe fulminating type; it is not unlikely that an even lower average rate of excretion would be seen in such cases.

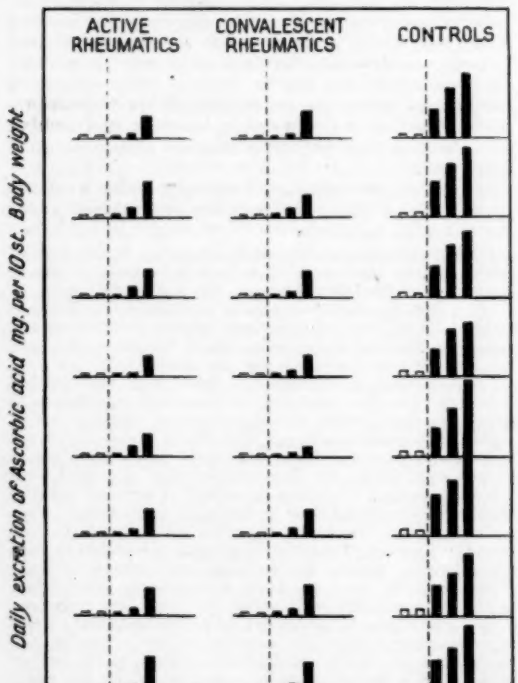

FIG. 2.—Response of rheumatic cases compared with controls to daily test doses of vitamin C. (A = resting level. B = responses after daily test doses.) It will be observed that the rheumatic cases, both active and convalescent, give little response until about the third day, the response of the control cases being generally greater on the *first* day than that of the rheumatics on the *third* day.
For ease in comparison, cases in each group are arranged in ascending order of their original resting levels.

RESULTS

As there was little significant variation in day-to-day excretion, for convenience the *average* values were calculated for each subject, and the results

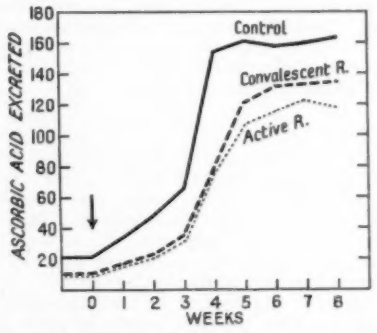

FIG. 3.—Excretion of vitamin C by controls as compared with active and convalescent rheumatics, following an increased daily intake of vitamin C. At the arrow the daily intake of vitamin C was increased by the addition to the diet of extra orange juice, at the rate of half an orange per day per one stone of body-weight. The values shown are the averages of 17 to 20 cases in each group. (Ascorbic acid in mg. per day per 10 st. of body-weight.)

(reduced to a basis of 10 st. body-weight) are summarised in Tables I. and II.‡ and shown graphically in Fig. 1. It will be seen that there is a striking difference between the range of values for the excretion of vitamin C as between the control subjects and the rheumatics.

(1) The *control subjects* without exception excreted more than the "standard" level of 13 mg. per day per 10 st. of body-weight—the figure found in earlier tests to be the rate of excretion of subjects receiving the reputed "minimal optimum" dose of vitamin C (25 mg. per day). The average (or median) value for this control group was 20 mg. per day.

(2) The *active rheumatics* in contrast, although they had been receiving similar diets for periods of from a few days to several months, excreted an average of only 9 mg. per day per 10 st. body-weight. Of these subjects no less than *92 per cent. of cases were below the standard.*

(3) The *convalescent rheumatics* continued to show a low rate of excretion (average 10 mg. per day, with *83 per cent. of the cases below standard*).

(4) Cases of *active surgical tuberculosis* resembled other conditions of infection or pyrexia in showing lowered excretion (average 9 mg. per day, with *100 per cent. of cases below standard*). But in contrast with the convalescent rheumatics, the cases of quiescent surgical tuberculosis showed a normal range of excretion (average 19 mg. per day, with *100 per cent. of cases above standard*). The cases of "half-active" surgical tuberculosis gave intermediate readings (see Tables I. and II.).

Effect of test doses.—In a number of cases test doses have been administered, and the results give striking confirmation to the conclusion that the rheumatic subjects, both active and convalescent, are in a lower state of saturation than the controls (Fig. 2).

Results with increased intake of vitamin C.—The same conclusion was apparent also when the regular daily intake of vitamin C was greatly increased. As will be seen from the summary of the results (Fig. 3), the rheumatic subjects, active and convalescent, took longer to reach a given level of

‡ Owing to pressure on space the tables that give the findings in detail have not been inserted.

excretion than did the controls receiving the same large dose of orange juice. Furthermore, when after five weeks the new state of equilibrium had been attained corresponding with the new diet, the new "resting level" for the rheumatics (convalescent as well as active cases) remained markedly below that for the controls (see Fig. 3). The difference between the excretion by the controls and by the rheumatic subjects is indicative of the apparent increased use of vitamin C by the rheumatic subjects; it may amount under the conditions of these tests to as much as 20 mg. per day, or more.

DISCUSSION

Significance of results.—Our results may be summarised by saying that rheumatic cases (including those in the convalescent state) have a deficit of vitamin C in their urine as compared with control subjects, even when their diet for a considerable time past has contained amounts of vitamin C that would certainly be adequate for normal subjects. While various alternative interpretations of this finding are possible, the simplest explanation appears to be that in the rheumatic subjects there is an increased need for vitamin C and probably an increased destruction in the body (vide supra). (The view that infection may in fact increase the metabolic need for vitamin C is not a new one,[23 24] and is supported by the old observation that infection may predispose to, or precipitate, an attack of scurvy.[25]) The question then arises: does the rheumatic state differ in this respect from other infective conditions, in which a lowered excretion, or a lower state of saturation, of vitamin C may also be met with? Further statistical studies of the excretion of vitamin C in various infectious diseases will be necessary before a final answer can be given to this question.

So far we have found lowered rates of excretion in virtually all the infective conditions studied, and this seems in general agreement with the findings of other workers, several of whom have recently recorded a diminished excretion of vitamin C in pulmonary tuberculosis.[25a] Many of the arguments adduced below for the administration of vitamin C in rheumatic conditions probably apply equally to other infective states. The use of fresh fruit drinks in pyrexia and convalescence, long given in a more or less empirical way, therefore may have good scientific warrant.

In the meantime however attention may be drawn to a specially striking feature of the rheumatic cases—the long-continued persistence of the low vitamin-C figures even when the disease is, clinically speaking, quiescent or convalescent, and the child is in an apparently good state of health.

The low values in convalescent rheumatism.—It seems likely that there may be a special significance in this continued low excretion in convalescent rheumatism, since it is a well-known clinical feature of the disease that such cases are in an unstable condition and are particularly liable to suffer recurrences. In other words, the persistent lowered excretion appears to be the sign of a continued latent infection which the body has not yet finally overcome. The results with quiescent surgical tuberculosis are in striking contrast in this respect, and fully in accord with the clinical experience that in this disease in young people a cure is likely to be permanent and free from relapse.

Possible diagnostic use.—It seems likely that the finding of a subnormal excretion of vitamin C when the diet is known to have contained for some time past the usually adequate allowance (e.g., 25 mg. ascorbic acid, or about one orange per day) might be used, in conjunction with clinical evidence, as a diagnostic index in juvenile rheumatism for revealing the presence of a continued latent infective process.

Therapeutic considerations.—The question still remains: is the vitamin-C deficiency (or relative deficiency) a cause or an effect of the infective process? From a practical point of view, if the explanation given above be correct, the two alternatives amount, in one sense, to almost the same thing: the rheumatic subject is one who appears to have an *increased need* for vitamin C. There seems no doubt that our experimental results are to be related more directly to the effects of rheumatic fever rather than to its origin. At the same time, however, it may reasonably be argued that when a child is exposed to the rheumatic infection he will be less likely to resist it effectively if his diet is low in vitamin C, the importance of which in combating infection is now becoming evident. In other words, there may be the dietary factor at the beginning of the disease as well as a continued alteration in the metabolism of the vitamin when the disease has developed. Similar conditions probably apply in other infective conditions; for example, it has long been credited that a defective diet may increase the susceptibility to tuberculosis, and it is stated that tuberculous meningitis rarely develops in hospital where the child is kept under sound dietetic and hygienic conditions. Be that as it may, a number of considerations unite to suggest that vitamin-C therapy is likely to be helpful in juvenile rheumatism, and at any rate should be given an extensive trial, both as a prophylactic measure and in curative treatment.

Arguments for vitamin-C therapy.—The evidence in support of this view may be summarised under the following headings.

(1) *Urine analyses.*—The findings given in the present paper suggest that there is in fact a lowered degree of saturation of the body tissues in the rheumatic state.

(2) "*Anti-infective*" *properties of vitamin C.*—There is much independent evidence (see above) that vitamin C is a factor increasing the resistance to infection, although its precise mode of action is not yet understood.

(3) *Epidemiological evidence.*—Much past observation indicates that the incidence of rheumatic conditions is often associated with an impoverished diet, in which partial deficiency of vitamin C is likely to be one of the most usual defects. (Previous tests [6] show that about 75 per cent. of the working-class families examined were "below standard" in their vitamin-C excretion; middle-class or professional-class individuals by contrast were generally above standard. A similar conclusion is reached from Orr's survey [26] of the food actually purchased in such populations. Again, in poor-law institutions juvenile rheumatism is said to have a strikingly diminished incidence compared with that in poor working-class areas [1]; the greatly improved food given suggests itself as a possible factor—the amount of money spent per head on food being considerably higher. As further evidence of a lowered state of nutrition among the rheumatic classes may be mentioned the finding of Ellison and Moore [29] of a subnormal range of vitamin-A reserves in the liver of children with rheumatic heart disease, *post mortem*.)

(4) *Experimental evidence.*—As mentioned above, it has been claimed that rheumatic lesions may be produced experimentally by deficiency of vitamin C plus superimposed infection.

(5) *Presence of latent rheumatism.*—The occurrence of a continued condition of relative "unsaturation," seen in convalescents while they are in a condition in which they are known to be liable to relapses, is a further argument for vitamin-C therapy.

(6) *Clinical evidence.*—The claim is already put forward by some clinicians that fruit and vegetables (=vitamin C) are useful therapeutically and prophylactically (see below).

A recent paper by Schultze,[27] following on the somewhat negative results of Sendroy and Schultze as to the utilisation of ascorbic acid by rheumatic children, already cited, concluded that the "clinical manifestations of acute rheumatic fever were not demonstrably affected by the oral or intravenous administration of ascorbic acid . . . [or of] large doses of orange juice." A similar finding was reached by Faulkner,[24] who noted however that vitamin C might increase the reticulocyte count in rheumatic fever and in certain other infectious diseases, and who supported the interpretation that such diseases might lead to a secondary deficiency of the vitamin. In contrast however with the negative therapeutic results of Schultze and of Faulkner, clinical opinion may be found to express such a divergent view as the following: "Rheumatism is largely avoided if plenty of the citrous fruits are taken, especially if lime or lemon juice is taken in water, along with green vegetables and an increased amount of water. I find that heart trouble of rheumatic origin often disappears by including the aforesaid in a dietary" (Glover [28]). In the absence of any generally accepted medical teaching in this matter we think the present results are sufficient to justify further clinical trials. In conclusion it may be added that as the consumption of one orange per day is more than sufficient to bring normal individuals to "standard," the fact that rheumatics are almost habitually below standard shows that the addition which we suggest to the diet cannot be considered unreasonable or far-fetched.

SUMMARY

A striking difference has been found between the range of values for the excretion of vitamin C in the urine of rheumatic patients (active and convalescent) and those of control subjects.

A group of 64 control subjects receiving an adequate institutional diet all excreted more than the standard level of 13 mg. per day per 10 st. of body-weight (the figure which was found in earlier tests to be the rate of excretion of subjects receiving their bare "reputed minimal-optimum" dose of vitamin C). The *average* (or median) value for this control group was 20 mg. per day (all values are recalculated to a basis of 10 st. body-weight).

In contrast, a group of 107 active rheumatic cases receiving the same institutional diets for periods of up to several months, excreted an average of only 9 mg. per day (92 per cent. being below the standard level of 13 mg.). This low level of excretion persisted in convalescent cases (86 cases, average excretion 10 mg. per day, with 83 per cent. of cases below the standard level of excretion of 13 mg.). This last finding accords with the clinical concept that convalescent cases are in an unstable condition, and liable to recurrences.

In common with other conditions of infection or pyrexia, a group of 23 cases of active surgical tuberculosis showed low rates of excretion (average value 9 mg. per day, and 100 per cent. of cases below standard), but in contrast with the results for convalescent rheumatics—and in keeping with the clinical concept—quiescent tuberculosis (46 cases) gave normal excretions. (A group of 19 cases of "half-active" surgical tuberculosis gave intermediate readings.)

The most reasonable interpretation of these results is that with the infection which underlies rheumatic fever there is a greatly increased metabolic use of (and need for) vitamin C, and a correspondingly lowered degree of "saturation" of the body tissues. In confirmation of this view, it was shown in further experiments that an increase in the daily intake of the vitamin, or the administration of a series of test doses, gave a lower urinary response in the rheumatic than in the control subjects.

For treatment the administration of large amounts of orange juice or other sources of vitamin C seems indicated both therapeutically and prophylactically.

Our thanks are due to Sir Frederick Menzies for kindly providing facilities for this work, to Dr. Gordon Pugh for his very helpful coöperation, to Miss Mary Allan for clerical assistance, to Messrs. Hoffmann-La Roche for supplies of the ascorbic acid, and to the Egyptian Government for generous financial support (for M. A. A.).

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DISTRICT NURSING.—To celebrate the jubilee of the Queen's Institute and County Associations for District Nursing, which occurs next year, it is proposed to issue a public appeal for funds. There are many places not served, or inadequately served, by these nurses, and to recruit and train another 1600 nurses will cost from £50,000 to £60,000. It is also necessary to increase the salaries of the existing nurses.

GENERAL MEDICAL COUNCIL

WINTER SESSION, NOV. 24TH–27TH, 1936

Prof. J. B. Leathes introduced the report of the EDUCATION COMMITTEE. Many representations had been received in favour of postponing the operation of the new resolutions to Oct. 1st, 1938, and it recommended this date to the Council. The Council agreed.

The revised rules for the registration of medical and dental students were discussed in camera.

Prof. J. S. B. Stopford presented the report of the visitation of the anatomy and physiology examinations, which showed that these were being satisfactorily conducted throughout the country. Attention was, he said, being paid to surface and applied anatomy and to X ray appearances.

Sir Henry Dale said that the BRITISH PHARMACOPŒIA 1932 had been well received and was selling rapidly, the total number sold now being 42,210. It was hoped to publish the next edition in 1941.

The Diploma in Public Health

Sir George Newman introduced the report of the PUBLIC HEALTH COMMITTEE. He asked for revision of the rules adopted in 1930, a revision which was partly medical and partly due to the increasing demands of the State. The Local Government Act, 1929, had profoundly affected the whole scope of public health administration, and new legislation had since been passed in respect of mental treatment, milk-supplies, and midwifery services. The rules issued from time to time epitomised the corpus of knowledge which the State expected, and had been the model for public health services throughout the world. They had been translated into every civilised language. Great Britain was the pioneer interpreter of the health of communities.

Sir George then presented the draft resolutions and rules for diplomas and degrees in sanitary science, public health, or State medicine. Application had been made to the committee to delete the word "registrable" from the first rule. The legal assessor had advised them that the word should be removed, so that the rule laid down a minimum period of two years between the attainment of "a qualification" and the grant of the diploma. Thus any medical man, whether on the British Register or not, could take the examination; but if not a registered practitioner he would then hold an unregistrable diploma. The gate was thus opened to those who had for years asked permission to sit for these examinations. The second rule made provision for candidates who could not leave their work for a twelve months' course; it clarified the existing rule allowing them to take an equivalent course spread over a longer period with a minimum of three months' whole-time study. Under the third rule a burden of analytical chemistry, radiology, and electrology was removed from the student; these subjects were no longer necessary to the medical officer of health. By the fourth rule there had been added to the syllabus: industrial hygiene, hospital administration, house planning and sanitary construction, and genetics and mental hygiene. In the sixth rule provision was made for certification of completion of course by other than medical officers. Town clerks and sanitary officers were often valuable tutors in the practical part of the course. To this part had been added, as new subjects, "Hospital Services" and "Arrangements for Dealing with Mental Disorder and Deficiency."

Dr. John Ritchie, M.O.H. for Dumfries, who seconded the proposals, emphasised the large number of subjects which might legitimately be included and the impossibility of doing justice to all of them. The committee's aim had been to simplify rather than to elaborate, and to set forth their ideas in general terms without going into matters of detail which could safely be left to the teaching bodies. Analytical chemistry had long been a source of irritation to teachers and students; they could not do enough to make it of any real value and yet had been compelled hitherto to spend a lot of time on a subject which the medical officer of health to-day always delegated to a chemist.

Sir Farquhar Buzzard asked why genetics and mental hygiene were put together.—Dr. Letheby Tidy thought Rule 1 was very wide; the word "qualification" would include minor qualifications from unidentifiable places and cause difficulty. He supposed it was still impracticable to ensure some post-graduate experience of medicine before starting on the D.P.H. course. He was sure everyone would welcome the omission of the word "electrology." He hoped the committee would consider the great complexity of genetics, and not think it was a simple and easy subject and push it too far.—Dr. D. J. Coffey urged that the basis of "qualification" in Rule 1 should be the usual reciprocity arrangements.—Sir Henry Dale pressed for an answer to Sir Farquhar Buzzard's question and supported Dr. Tidy's views on genetics. The association of genetics with mental hygiene was misleading and unfortunate.—Sir George Newman said he rather agreed, but there was a feeling that genetics should appear somewhere. He suggested a separate section.—Mr. Bishop Harman thought that to leave genetics alone in a section would make the subject too important.—Dr. Tidy suggested the formula: "the principles of genetics in relation to public health."

It was agreed to that the list should read:

(*e*) House and town planning and sanitary construction.
(*f*) The principles of (*a*) genetics,
(*b*) mental hygiene,
in relation to public health.

Prof. Sydney Smith thought this theoretical part of the syllabus was getting overcrowded and asked how far the subjects were to be taken. He welcomed the widening of Rule 1 on behalf of practitioners in the East.—Dr. H. H. Brackenbury thought the old rule answered this difficulty. It said "physiology and biochemistry in relation to nutrition and hygiene."—Dr. Coffey thought the addition of "town planning" to the committee's original suggestion of "house planning" would add many complications.—Mr. H. L. Eason pointed out that this report was going to the licensing bodies and such points could be discussed there and the decisions referred to the Council at its next meeting.

The draft resolutions were then adopted.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

MALIGNANT DISEASE OF THE THYROID

AT a meeting of the Edinburgh Medico-Chirurgical Society last week Mr. James Graham read a paper on malignant disease of the thyroid gland based on his personal experience of 20 cases, 7 of which were males and 13 females. He pointed out that the condition is much commoner in those countries in

which endemic goitre is prevalent. He distinguished five types of malignant disease of the thyroid gland: adenocarcinoma, papillary adenocarcinoma, spheroidal cell carcinoma, epidermoid carcinoma, and sarcoma. The adenocarcinoma is much the commonest type and is liable to develop in cases of simple goitre. In the early stages the tumour is intracapsular and is then difficult, or impossible, to diagnose. In the later stages the extensive infiltration makes the diagnosis obvious. The papillary adenocarcinoma is a less malignant type of goitre and may show no spread even after being present for many years. The spheroidal cell carcinoma is the most malignant type. The epidermoid carcinoma is rare and has to be distinguished from the tumours which spread directly from the œsophagus or pharynx. Sarcomata are very rare. In the diagnosis of malignant disease of the thyroid gland, hoarseness, dyspnœa, and dysphagia are much more common in malignant than in simple goitre. X ray examination of the neck and chest is often of value for it demonstrates the displacement of the trachea and also the presence of retrosternal goitre or enlarged mediastinal glands. In American clinics, however, as many as 50 per cent. of the cases of malignant goitre are not diagnosed before operation. Radiography of the bones may be valuable and the presence of secondary tumours in bone may cause symptoms before the primary growth is noticed. In the differential diagnosis, simple or calcified nodules in the gland, Riedel's thyroiditis, syphilitic thyroiditis, and carcinoma of the œsophagus have to be particularly considered. Mr. Graham went on to consider the question of treatment. He said that operation is indicated when the diagnosis is made early in cases of malignant adenoma. To be successful the operation should be undertaken at a stage when the diagnosis is suspected rather than definite. It is too much, however, he said, to recommend operation in all cases of nodular goitre, but a suspicious attitude should be adopted towards all these when they appear in older patients. In advanced cases operation may have to be carried out to relieve compression on the trachea, but when removal of the tumour is incomplete, recurrence sometimes occurs with great rapidity. Some cases of malignant goitre show an extreme degree of radio-sensitivity, and Mr. Graham was able to illustrate cases in which a large mass of disease disappeared with deep X ray therapy in the course of a few weeks.

HOSPITAL RECONSTRUCTION

Last week the Duke of York reopened the Church of Scotland Deaconess Hospital which has been reconstructed at a cost of over £40,000. This hospital, which is the only hospital in Britain that is maintained by a Protestant church, was built 42 years ago. To the existing hospital accommodation, 32 beds have been added, and the total is now 86. The hospital is situated in a poor district of the town and deals with all types of medical and surgical cases; it also has a maternity service and children's ward. There are no paying beds.

SLUM CLEARANCE PROBLEMS

The Edinburgh town council are concerned over the difficulty of providing adequate medical attention for the population in their new housing scheme at Niddrie Mains. The population of this area nearly amounts to 8000 and there is no resident doctor in the neighbourhood. Many of the people now living in this new area were accustomed to make use of the dispensaries in the centre of the town. These dispensaries, however, are all supported by charity, and it is evidently beyond the power of the local authorities to establish a general dispensary of this type. The distance from the university would also make it difficult to obtain medical students willing to work in a dispensary in this area. The difficulty of obtaining medical attention, particularly for the children, has been a cause of considerable complaint by the population in the new housing area. The town council propose to attempt to improve matters by arranging for a resident nurse and doctor in the district.

IRELAND

(FROM OUR OWN CORRESPONDENT)

SCHOOL ATTENDANCE AND MEDICAL CERTIFICATES

SINCE the School Attendance Act became law in the Irish Free State a few years ago difficulties have arisen from time to time as to the liability of dispensary medical officers to give certificates of illness in regard of children under their medical care. Officers of the Civic Guard, who are charged with the enforcement of the Act, frequently demand such certificates, and suggest that it falls within the dispensary doctor's duty to issue such certificates free of charge. There is no such duty on dispensary doctors and up to the present they have refused to issue certificates, and most magistrates have been satisfied with other evidence. Recently, as we learn from the daily press, the senior justice of the city of Dublin, in dealing with a prosecution for non-attendance at school, was informed that a dispensary medical officer, Dr. James Devane, had refused to issue a certificate as to the fitness or otherwise of a certain child to attend school. The justice issued a summons to Dr. Devane to attend court, and the latter explained that the issue of a certificate was no part of his duty, and urged that it was unfair that a doctor should be the only member of the community expected to give his professional services for nothing. If he gave one certificate free he would have to give thousands. In reply the justice said that unless Dr. Devane was willing to send a letter or a certificate he would have to issue a summons for his attendance. There is no doubt that a magistrate has power to compel the attendance in court of any member of the public, but it is not clear that he has power to compel a medical man to give professional evidence without the payment of a fee. It is to be hoped that any ambiguity on this point will be cleared up.

RETIREMENT OF A PUBLIC OFFICIAL

Disquietude has been caused in the public medical service of the Irish Free State, as well indeed as in the minds of the general public, by the summary compulsory retirement as from Dec. 1st of Mr. E. P. McCarron, secretary to the Department of Local Government and Public Health. The disquietude is all the greater because he was given only a few days' notice of his dismissal and was given no reason for such action, nor any information of the nature of any complaints made against him. Mr. McCarron, who is about 55 years of age, has been in the public service since he was a boy. Having had several years' service as one of the auditors of the old Local Government Board, he was chosen as secretary when the Department of Local Government and Public Health was established after the change of government. In the period since he took office the whole public health service of the country has been organised,

and much of the work of this organisation fell on the shoulders of the secretary of the department. He was enthusiastic in all matters concerning health, both as regards public health administration generally and as regards the improvement of housing. Recently he gave much help toward the formulation and realisation of a scheme to encourage and endow medical research. Medical men who met him to discuss matters concerning health or the interests of the profession always found him an energetic, efficient, and very courteous official.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE BOVINE TYPE IN TUBERCULOUS MENINGITIS

BETWEEN 1932 and 1936 E. Lesné, A. Saenz, M. Salembiez, and L. Costil have investigated 138 cases of meningitis in children who had not been given B C G, and who were treated at the Trousseau Hospital. The results of this investigation, submitted to the Academy of Medicine on Nov. 17th, constitute an indictment of the bovine type of tubercle bacillus. Eight of the cases could be dismissed, the culture of the cerebro-spinal fluid proving negative, and the clinical course of the disease showing it to be non-tuberculous and curable. Of the remaining 130 cases, 121 yielded the human type of tubercle bacillus on Löwenstein's medium, which, in the opinions of these investigators, is the best available, not only for the culture of tubercle bacilli, but also for the distinction between the human and the bovine types. In other words, the mere aspect of the culture gives a valuable clue to the type present, and information on this point is thus made available before the bacilli in question are injected into a rabbit. There were nine cases in which the bovine type of tubercle bacillus grew on this medium. As many as seven of these nine children were less than 5 years old, and eight had drunk raw cow's milk for a long time. Not one of these nine children had been reared in Paris, and nearly all of them had lived for a long time in the country. On the other hand, about three-quarters of the children infected with the human type of tubercle bacillus had lived in Paris or its suburbs, and only 10 per cent. had lived in the country. In the overwhelming majority of the human-type cases, contacts with other human beings suffering from tuberculosis were discovered, whereas among the 9 bovine-type cases there were as many as 5 with no family history of tuberculosis, and 3 in which information about contacts was not available. The authors of this report quoted Martel as stating that, in 1905, 5 per cent. of French cattle suffered from tuberculosis of the udder; and in one such case they have counted 100,000 virulent bacilli per c.cm. of milk. They concluded that the consumption of raw milk by children is to be deprecated under the conditions existing in France.

THE INTERDICTION OF MEDICAL PRACTICE AFTER THE AGE OF 65

It is symptomatic of the atmosphere in which the Pomaret scheme for the compulsory retirement of doctors at 65 is discussed that many if not most of those that air their opinions on it refer to it as the Pomaret law. Now it is nothing of the sort. At present it is no more than a scheme—the draft of a Bill, if you like, but certainly not a fait accompli in the sense that it has been passed by both Chambers and put on the statute books. It is doubtful if it ever will be. For though the present Government already has a remarkable record for carrying through legislation of heroic tendencies, the Frenchman's capacity for absorbing revolutionary ideas reaches saturation point sooner than most of you on the other side of the Channel imagine; and when the matter is debated in the Chambers, every senator and deputy will be sure to have at his elbow, figuratively speaking, some old doctor reminding him of the innumerable doctors over 65 who are still worth their salt and of still more numerous doctors well under 65 who are not.

This point has been very ably argued by Dr. Marcou-Mutzner in a recent number of *Presse Médicale*. His plea is for natural selection instead of the blindfold selection exercised by a hard-and-fast age limit. As he points out, one man may be old at 50, and another young at 70. Even M. Pomaret himself seems to have been aware of the differences between the real age of a man and his legal or birth-certificate age; for he has made the concession of allowing a doctor on the staff of a Paris hospital and a professor of the faculty of medicine to remain at work till he is 70; and if he is a member of the Institute, he may go on working to the dizzy age, for ordinary men, of 75. It would be interesting to know if his concession to grand old men is biologically justifiable. Probably it is. In his argument for natural selection, Dr. Marcou-Mutzner maintains that the patients themselves know quite well when a doctor is deaf, absent-minded, forgetful, or shaky of hand; and they never forgive him if this last quality or disqualification spoils an intravenous injection. Whatever the technical age of such a doctor, these signs of premature or mature age put him on the shelf without the law having to be invoked. It is a pity that Dr. Marcou-Mutzner spoils an otherwise excellent argument by claiming that patients also know whether a doctor is familiar with recent events in his profession or not. This is surely asking too much of the intelligence of the average patient.

ACTIONS FOR DAMAGES AGAINST DOCTORS

From time to time Dr. J. Noir regales the readers of *Concours Médical* with the experiences of that excellent institution, the Sou Médical, which defends the interests of its members when actions are brought against them by unappreciative patients. These actions seem either to demonstrate remarkable stupidity and cupidity on the part of the patients, or tragi-comic stupidity on the part of a doctor. In one of Dr. Noir's cases, a certain Dr. X was called on to treat a patient suffering from a posterior dislocation of the shoulder, very difficult to recognise. The overlooked dislocation was not reduced, and permanent functional weakness of the arm ensued. The patient's husband brought an action against the doctor because his diagnosis had been incorrect, and because no radiological examination had been made. According to the expert evidence called, the difficulty of diagnosing such a lesion correctly was such that the error committed was altogether pardonable, all the more so because the doctor had recommended a radiological examination which the patient had obstinately refused. The husband's objection that he himself had never heard the doctor recommend a radiological examination was weakened by the admission that he had not been present at all the discussions between his wife and the doctor. The latter won the case. So far so good. But Dr. Y let the Sou Médical badly down. Summoned to the victim of an accident, he diagnosed a comminuted fracture of the humerus. An enormous effusion having formed, he recommended waiting till it was absorbed before he applied splints. The patient

pleaded for a radiological examination, but the doctor insisted on its uselessness. Then he went away. Seventeen days after his departure, his locum tenens, blissfully ignorant of all that had happened, insisted on a radiological examination which showed no fracture at all. But there was a subcoracoid dislocation. It was reduced, but the patient developed progressive paralysis of the right arm. Now the patient was a distinguished artist, aged 50, and he was allotted 160,000 francs in damages. Hence Dr. Noir's advice "Never consider a radiological examination useless, particularly when a patient asks for it."

MEDICINE AND THE LAW

Lump-sum Accounts

IN Little *v.* Nutter at Liverpool county court last week the judge made interesting comments on the medical custom of sending in bills without furnishing detailed particulars. The plaintiff, a Liverpool practitioner, had attended the wife of a cotton manufacturer from January to July, 1935, and sent in an account for £47 10*s*. The defendant said he was willing to pay what was reasonable, but he had never been given particulars or told what was the basis of the charges; it was not till Nov. 26th that he obtained explanations in the form of extracts from the doctor's case-book. The learned judge observed that the defendant was taking the view of a business man but was dealing with a professional man. The doctor was not a tradesman selling goods. "You cannot weigh up the services of a doctor in the same way as the services of a business man: in a case like this I think it is not possible to price each item." Judgment was given for the amount claimed with costs. Although the court thus found the rendering of a lump-sum account to be a reasonable practice, there are undoubtedly cases where a formidable and unexplained total, especially if presented after a substantial interval, sets the recipient thinking of excuses for non-payment.

Complaint of a Pork Chop

The gradual elimination of juries in High Court cases is giving the judges some awkward questions to answer single-handed. A member of the Royal Automobile Club had a lunch which included half a dozen oysters, a pork chop, some milk pudding, and some mineral water. Between 4 and 5 next morning he became ill and his regular medical attendant diagnosed food poisoning. The pork chop fell under suspicion and the patient eventually sued the proprietors of the club for damages. The illness was post hoc; the judge had to decide if it was propter hoc. A plaintiff must establish his case, and it is never an easy task to identify such illness with a particular item of food. The pork chop might well claim to be deemed innocent until it was proved to be guilty; the club kitchen arrangements were given an excellent character; might not the roast chicken which the plaintiff ate for dinner that evening have been the culprit? The defence threw out the suggestion that the plaintiff might be a carrier of germs which caused illness when he ate indigestible food. The judge said there was no evidence to support this theory. After not a little discussion of the Gaertner bacillus, the court felt itself on solid ground in accepting the diagnosis and the evidence of the plaintiff's regular medical attendant. Mr. Justice Singleton held that the plaintiff had proved his case and awarded him £625 damages.

Compensation for Miner's Nystagmus

In Richards *v.* Goskar the House of Lords has delivered a judgment which enlarges the liability of colliery companies to pay compensation to miners suffering from nystagmus. Richards, the appellant, was certified as suffering from miner's nystagmus and as being disabled from earning full wages at the work at which he was employed. He returned to his former work at his former wages, although he had not in fact recovered from the disease; he then again became disabled by the original nystagmus. The question in the case was whether he could rely on the original certificate (as he himself claimed) or whether (as the colliery company contended) he must obtain a fresh certificate of disablement as a condition of receiving compensation. As is well known, industrial diseases like miner's nystagmus entitle the workman to compensation as if they were industrial accidents. The disease is in Lord Atkin's phrase, a "notional" accident. In making the language of the Workmen's Compensation Act fit the case of an industrial disease, it was necessary to fix the date of the happening of this. The Act therefore stipulates that "the disablement . . . shall be treated as the happening of the accident." In the case of Richards, the county court judge felt himself obliged by previous decisions to hold that the disability to earn full wages was the accident. He consequently found himself unable to award compensation because, for some time after the original disablement, Richards was able to earn full wages at the employment in respect of which he was originally certified. This result, Lord Atkin pointed out, put the sufferer from industrial disease in a relatively worse position than the sufferer from industrial accident. Disability was not to be translated into "accident" for all purposes. The county court judge had taken too narrow a view of some of the decided cases. Richards was entitled to have his claim for compensation assessed by the county court judge. The appeal succeeded and the case was remitted to the county court for such assessment.

Workman's Death from Blood Poisoning

Another judgment delivered by Lord Atkin in a workmen's compensation case some weeks ago was of considerable interest. An electrician worked under the floor of the electrical installation at the Lancaster Infirmary. He had, in the course of his job, to lie for long periods on his back, resting his head on a dusty floor in the foundations. The atmosphere was so hot that the workmen took off their caps. When the man came home one night, he showed his wife a sore place on the back of his head; he said he thought he got it at his work two days before. Making light of it, he continued at work till he had to stay at home owing to pains in the chest and head. The doctor found he had bronchitis in both lungs and inflammation of the scalp tissues. He died in the infirmary of septic meningitis and septic pneumonia. Post-mortem examination indicated that the infection causing the septic condition entered through the break in the skin of the head. The county court judge accepted the probability that the injury was sustained at the work, and awarded compensation to the widow and infant daughter. In the Court of Appeal Greer and Scott, L.JJ., said there was no evidence that the accident arose "out of and in the course of the employment." In the House of Lords Lord Atkin said the case was entirely one for the county court judge, and there was evidence to support his finding. He himself, he said, would unhesitatingly have come to the same conclusion.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

BY A CHRONICLER

II

In the period vaguely named the Dark Ages there was no assembling of scientific observations bearing on medicine that was open to any general inspection, such as could exist in classical times, when industrious scribes met the situation. Our debt to them is apt to be overlooked. Down to the time of printing the manuscript—including here graven plates, potsherds, clay and wax tablets, parchments and papyri—filled the place now occupied by print. These manuscripts were stored in libraries where the rolls could be seen, and in this way the works of Hippocrates, Celsus, and Galen, especially of the last, were open to consultation. But in later times the monastic records, representing the fine work of the Church in preserving culture throughout evil times, were not similarly available.

* * *

The word newspaper came into use in the reign of Charles II, the earlier periodicals being the production of news-letter writers or "intelligencers"—men retained either by private and important individuals or perhaps by a group of such. These news-letters or "corantos" contained no medical information and were made up of the propaganda of various political parties. The word is the same as *courant* or current, and in the form of "courier" became a frequent title for newspapers at the end of the eighteenth century. Apart from the private correspondents the writers were not held in high esteem judging from this passage from *News from the New World: Discovered in the Moon*, a masque played before King James in 1620 and written by Ben Jonson. The chronicler or reporter, the factor or publisher, and the printer discourse as follows:—

The Chronicler: I am for matter of state, gentlemen, . . . to fill up my great book, which must be three reams of paper at least . . .

The Factor: I do write my 1000 letters a week ordinary sometimes twelve hundred, and maintain the business at some charge . . . I have friends of all ranks and of all religions for which I keep an answering catalogue of dispatch, wherein I have my puritan news, and my pontifical news . . . (and points to the lies that get into print).

The Printer: Sir, they (the stories) were made for the common people; and why should not they ha' their pleasure in believing lies are made for them, as you have in Paul's that make them for yourselves.

It will be seen that by the style of "A Chronicler" I assume no high status.

A quotation from "A Book of Characters," published in 1631, leaves even less doubt as to public opinion of the journalist of the period, though probably this was not so much the opinion of the public as that of the Star Chamber. For when the corantos began to be circulated they attracted the unfavourable notice of that Court, as licensers of printed work. The Star Chamber had a hard task, for the corantos had an established popularity. The mere titles of them make up six or seven columns of Muddiman's "Hand-list of Newspapers," and indicate that the subjects were purely political. In their later form they were weekly pamphlets priced at one groat, equivalent to-day to about one shilling. They came to an end in 1642 amid a crowd of "Diurnals," the word derived from Acta Diurna, and in 1643 a Board of Censors for the press was set up by Parliament.

A journalist of a period some ten years before the suppression of the corantos is thus described by Richard Brathwaite, a forgotten poet and author of "Barnabee's Journal":—

"The Coranto coiner is a state newsmonger and his own genius in his intelligencer. His mint goes weekly and he coins money by it. Howsoever the more intelligent merchants do jeer at him, the vulgar do admire him, holding his novels oracular, and these are usually sent for tokens or intermissive courtesies between city and country. He ever leaves some passage doubtful as if there were intimate secrecies of state, closing his sentences abruptly with 'Hereafter you shall hear more.' He carries his table-book about with him; he does not pull it out publicly. Paul's in his walk in winter, Moorfields in summer, where the whole discipline, designs, projects, and exploits of the States, Netherlands, Poland, Switzerland, Crimchana and all are within the compass of one quadrangle walk most judiciously and punctually discovered. Thanks to his good invention he can collect much out of very little."

We have here two uncomplimentary descriptions of the press man of the seventeenth century, prepared to write from the town to the country, or from the country to the town, upon information picked up through gossip. Certainly St. Paul's Cathedral and churchyard, and the neighbouring open country of Moorfields, were admirable places in which to gather the spirit of the day from gossip, and thus ascertain what topics would make acceptable subjects. Note in the allusions to Tartary and China a hit at the omniscience pretended to. The highest development of the news-letter or coranto was reached under Henry Muddiman, ancestor of the author from whom I have just quoted, and his letters were the origin of the *London Gazette*, where to-day your name can still be printed on the occasion of your elevation to a peerage or your submersion in a bankruptcy.

* * *

The corantos did not attempt to give medical information; they were political propaganda. The first definite medical journal to be published in this country was the *Foreign Medical Review*, and a natural guess would be that we have here an example of the idea that "they do things better abroad." The idea still has force—"A man at Bad-Zwieback gave him glasses and he can see better than ever"; "She went to such a clever doctor at Brioche les Bains and he put her right at once"; "He's consulting a fellow at the Kalbsbraten Clinic who has a wonderful treatment"—are not such remarks to be heard at every social function? Are they not particularly frequent at informal gatherings like sherry parties, where men and women incline to use medical treatment as a subject for conversation? As a matter of fact, they did do these things better at that time abroad, for when the *Foreign Medical Review* was launched, there were numbers of continental medical journals. How many can be seen in a list contributed to the *Bulletin* of the Institute

of the History of Medicine, published by the Johns Hopkins University in the supplement of July, 1934. The list was compiled by Dr. Fielding Garrison, the well-known medical historian. The detailed enumeration occupies 40 quarto pages in double columns, and in this long array will only be found some seven or eight English publications, including transactions of societies, which are in no sense journals.

The *Foreign Medical Review* ran for ten years at the end of the eighteenth century and it has always, to me, been a matter for surprise that no medical journal made its appearance some years earlier under the editorship of a great man of letters, both a doctor and a journalist. For it first appeared in 1779, when Dr. Tobias Smollett's political journal, *The Briton*, had already seen daylight and Smollett's medical experience, knowledge of affairs, and zeal in the pursuit of what interested him would have made of him an ideal pioneer of medical journalism. We can see in his novels how exactly he estimated many professional positions; he made no name in the medical profession, and, oddly I think, his regular employment of assistants on his historical works never suggested to him the idea of collecting a staff for the production of a medical journal.

The *Foreign Medical Review* had slight support, but its pattern of extracting passages from medical works was followed by successors, where the distinctly medical appeal was often lost, medicine being treated as a branch among others of general science. The descriptions on the title-page of the first volume of these publications, and the wording of the first prefaces are remarkable for their promises, but a glance through the volumes shows how little attempt was made to keep them. There seems generally to have been great reliance upon a title and here changes were made which sometimes render a paper difficult to trace. Brief perusal of the first volumes of each paper shows that the fare provided could satisfy no appetite for contemporary information; yet things will catch the eye which to-day have a professional interest. The first volumes now noted are in the library of the Royal Society of Medicine.

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Foreign Medical Review, 1779.

"An account with extracts of all new books published on natural history, botany, materia medica, chemistry, anatomy, surgery, midwifery, and the practice of physic in every part of the Continent of Europe; together with intelligence of new and interesting discoveries."

What do we get in return for this handsome offer? Reviews transcribed from German and Swedish originals, observations on arnica by two Viennese doctors, an introduction to the study of midwifery by the physician to the Landgrave of Hesse-Cassel, an essay in Latin on conium, an article on the Swedish pharmacopœia, and belated obituaries of Haller (ob. 1777) and Linnaeus (ob. 1778). Haller is described as "Lord of Goumens le Jux, Feudi in Eclagens, and Knight of the Polar Star." How Thackeray would have rejoiced in this description, which would have exactly met the case of a grandee at the Pumpernickel Court.

London Medical Journal, 1781. By a Society of Physicians. The preface points out that the backing of the venture is such that success is deserved. Like the *Foreign Medical Review*, extracts from foreign literature formed the main contents. The title was changed to *Medical Facts and Observations*, but either the facts were not so or the observations were unarresting, for the career of the paper was a short one.

Medical Chirurgical Review, 1820, adding "Journal of Medical Science" in 1822 and reverting to the shorter designation between 1824 and 1828. In 1828 the title became the *Medico-Chirurgical Review and Journal of Practical Medicine*, and this designation was preserved for the next 19 years. The first number is described as "a concise account of the various publications in different languages on medicine and surgery" and as "a continuation of the Medico-Chirurgical Journal"; I have not been able to identify with certainty this predecessor, and the unsigned preface makes no reference to parentage. The journal was published under its different titles for very many years, and the first number promised well. The original editors were "Dr. William Shearman, Dr. Shirley Palmer, and James Johnson, Esq., surgeon to H.R.H. The Duke of Clarence's Household." In this volume we find a clinical case of a "Fœtus found in a Boy" by Nathaniel Highmore, an article on Diseases of Females by Charles Mansfield Clarke, and a review of Orfila's celebrated work on poisons. The article by Sir Charles Clarke was probably a recent contribution, the reverence for titles in early medical journalism being such that, had he secured his F.R.S. or his baronetcy at the time, the distinctions would have been noted. Clarke's medical record reads singularly to-day. A student under Hunter at St. George's Hospital, he seems to have gained no professional qualification but was awarded the Lambeth M.D.; he must, however, have done something to justify a scientific reputation for he was made F.R.S. before he was 40, appointed physician to Queen Adelaide, and created a baronet. There was no hurry in publishing the review of Orfila's "Traité des Poisons," that finest of single-handed efforts in practical therapeutics, for the book had been out nine years. Nathaniel Highmore, of antrum fame, had been dead 100 years; perhaps the contribution was from a descendant using an honoured name. The paper had a long life and its editors resented the appearance of *The Lancet*.

Medical and Physical Journal, 1799. Conducted by T. Bradley, M.D., and A. F. M. Wilich, M.D., and continued as the *London Medical and Physical Journal*, in a new series under the editorship of Dr. Roderick Macleod. The claim made in the first number is that the journal will "Contain the earliest information on subjects of medicine, surgery, pharmacy, chemistry, and natural history, and a critical analysis of all new books in this department of literature." The first number suggests that a real endeavour was made to redeem some of the pledges, and a good deal of ground was covered; the journal did not obtain any substantial adherence, but lived and died under the same title.

The *Philosophical Magazine*, 1798. The magazine incorporated a predecessor which I have not seen called the *Journal of Natural Philosophy, Chemistry, and the Arts*. The founder proposed to treat of "the liberal and fine arts, agriculture, manufactures and commerce." He was one Alexander Tilloch, a learned and ingenious man. A journalist and editor of a lay paper, he was better known for his practical interest in printing. He was the inventor of a process for engraving the notes of the Bank of England, which was not adopted, though later the method which met with favour appears to have been

virtually the same. He also had views on the Apocalypse, there following the example of Sir Isaac Newton.

Alexander Tilloch was a business man, and made no suggestion that he proposed to pursue art for art's sake; his object was, he said, to communicate such teachings of art and academic knowledge as can be useful in material pursuits, while his intention to take his matter from all convenient sources is candidly expressed by a quotation on his title-page from Justinian, which may be translated thus: "Neither is the texture of the spiders' web better because it is produced from themselves, neither is our texture the worse because like the bees we take our draughts from foreign sources." Other subjects were better handled than medicine. In the first bound volume, which comprised the output of four months, we have an article headed 'Medicine' which announces that "improvements have been made in the German key for extracting teeth." Another article, headed 'Surgery,' is a note on "The retardation of age by preventing the accumulation in the tissues of calcareous matters."

In a later volume we get Dr. Perkins's discovery of the influence of metal tractors in removing many of the diseases of the human body. This communication has a modern flavour when the benefits attributed by ardent proselytes to osteopathy are recalled, a metallic medium being substituted for the erudite touch. Dr. Perkins was an American and made therapeutic claims to which some disciples within the ranks of the medical profession subscribed; but official medicine repudiated the work because the technique and conclusions were based on nothing that was comprehensible upon established scientific grounds. His procedure was "to apply externally to parts affected with diseases, metals and compounds of metals formed into instruments of various forms and sizes termed tractors." Dr. Perkins's assertion was that on drawing them lightly over parts affected these tractors could (in his own words), "remove typical diseases of the human body where an extra degree of nervous energy or vital heat was present unless such disease was situated in some of the internal viscera too remote from the part where the instrument could be applied." Then follows a list of diseases—wherein are included rheumatism, gout, erysipelas, lock-jaw, inflammatory tumours, painful burns, and tooth-ache—which are amenable to treatment by the tractors, the evidence of savants and grateful patients being added. The editor of the *Philosophical Magazine* remained unimpressed, considering that the asserted presence of some galvanic action was unconvincing. Incidentally, it was conversion to this sort of therapy that ruined Dr. John Elliotson, the learned physician at University College Hospital to whom Thackeray dedicated "Pendennis."

Annals of Philosophy, or *Magazine of Chemistry, Mineralogy and Mechanics, Natural History, Agriculture and the Arts*, 1813. Edited by Thomas Thomson, M.D., F.R.S., member of the Imperial Medico-Chirurgical Academy of Petersburg. The first preface states that the intention is to publish "memoirs on particular branches of science, and the transactions of Philosophical Societies." A new series began in 1821 and was continued as *The Philosophical Magazine and/or Annals of Philosophy*; this was an amalgamation with the *Philosophical Magazine*. The editors now were Richard Taylor, F.S.A., and Richard Phillips, F.R.S. The magazine was continued as the *London and Edinburgh Philosophical Magazine and Journal of Science*, and after Vol. 16 "Dublin" was added to the title. The annals had very little of medical interest, references to medicine being thrown in now and then, probably to justify the comprehensive range, but the first volume has a paper on diabetes by Dr. William Henry, F.R.S., author of an "Epitome of Chemistry." This was a really distinguished medical contributor. A Manchester general practitioner, he went to Edinburgh, attended courses in chemistry, and when quite young made important communications to the Royal Society. His "Epitome of Chemistry" ran through eleven editions in the next twenty-eight years. Henry's medical essay forms a link with contemporary journalism, for in an early issue of *The Lancet* there is a long and appreciative review of his experiments on the disinfecting powers of increased temperatures.

London Medical, Surgical, and Pharmaceutical Repository. The magazine was started in 1814 and the words "Surgical and Pharmaceutical" were soon dropped from the title. The first editors were George Mann Burrows, M.R.C.S., William Royston, F.L.S., and Anthony Todd Thompson, F.L.S. Burrows, who appears to have been the real founder, was specially indefatigable in securing the passage of the Apothecaries Act in 1815. He became a leading authority on insanity. Anthony Todd Thompson was also an interesting man; the son of an American Colonist he graduated in medicine at Edinburgh, and gained a large practice in South London. He was young when he joined Burrows in the direction of the *London Medical Repository*, but he had already written a conspectus of the pharmacopœia which had run through several editions and proved to be the framework of the pharmacopœia as we now know it. He became professor of pharmacology and therapeutics in the new University of London and was a frequent contributor to the early *Lancet*. In 1882 the *London Medical Repository* came under the editorship of James Copland, later the author of the "Dictionary of Practical Medicine." Copland was a divinity student originally, but turned to medicine and graduated at Edinburgh. He took an appointment as medical officer on the Gold Coast where his experiences of disease and native manners were sensational. He is depicted by Sir Norman Moore as a man of extraordinary industry and perseverance, but without the gift of discrimination. The *London Medical Repository* was more definitely professional in its contents than any of its predecessors, and there may be noted in its pages the first Hunterian Oration, which was delivered by Sir Everard Home, the untrustworthy curator of Hunter's manuscripts, while there is also an article by Baron Larrey, Napoleon's great military surgeon. The *London Medical Repository* marked a real intent to produce a medical journal. The predecessors aimed to be scientific encyclopædias wherein medicine would be included.

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The Lancet made its appearance in 1823, and with it medical journalism assumed a new shape. The biographical notes on the founders or editors of its predecessors show that they were on the whole a distinguished group, and that the failure of their journals was due simply to their conception of what their readers might want. They had a touching belief in the influence of titles, and as far as medicine was concerned made huge promises which they could not fulfil.

PUBLIC HEALTH

The Nation's Health

THE annual report of the chief medical officer of the Ministry of Health is a personal commentary on the medical matters which came before the Ministry during the year under review; it is not the official report of the Ministry, which is issued separately beforehand.[1] It consists of statistics and facts which the Ministry supplies, along with comments upon and criticisms of those facts for which the author alone is responsible. The 1935 report[2] is the first for which Sir Arthur MacNalty, as chief medical officer, is solely responsible. From his published works and from his experiences we should have expected that Sir Arthur's attitude towards preventive medicine would differ somewhat from that of his predecessor, Sir George Newman, for he is more of a clinician than a sanitarian, and approaches public health as a physician rather than as a biologist. As an account of the progress of medical science during 1935, his report should appeal strongly to the medical profession as a whole; but members of the public health service will find less in it to interest them unless they are engaged in specialist activities.

A NEW INTERPRETATION

In an introductory note Sir Arthur MacNalty recalls Sir John Simon's statement, made forty-five years ago, that the science of preventive medicine is advancing partly because the causes of disease are becoming more exactly understood and therefore more readily prevented, but even more largely owing to the creation of new methods of pathological research. This was the beginning of a new and wider interpretation of preventive medicine. The dividing line between preventive and curative medicine, Sir Arthur remarks, grows fainter and fainter, and in many instances has virtually disappeared. He illustrates the disappearance of this detachment by the recent trend of events. The tuberculosis work of local authorities includes both prevention and cure. In the child welfare and maternity services the clinician works side by side with the hygienist. The insurance medical service is designed for the prevention as well as the treatment of disease and is working to-day in closer relation with the public health service. The Local Government Act of 1929 provided for more intensive coöperation between the voluntary hospitals and the municipal hospital resources. And, finally, the problem of proper nutrition, to which an advisory committee of the Ministry has given attention for the last five years, was not, he reminds us, a new interpretation of preventive medicine. In 1862 the Privy Council inquired into the nourishment of distressed operatives in Cheshire and Lancashire, and in the following year Dr. Edward Smith, F.R.S., observing that insufficiency of food does not nearly so much affect the married worker as it affects his wife and children, attempted to frame a minimum daily diet. We are still, Sir Arthur concludes, working at the same task, but with a coöperation of State and voluntary effort which was then neither available nor contemplated.

THE YEAR 1935

England and Wales was freer from disease in 1935 than in any other year of which we have records. Not only was the incidence of disease low, but severity was low also and, what is still more satisfactory to the medical profession, the year showed evidence, always difficult to obtain, that treatment was unusually successful. Of this we may quote two instances. The notifications of ophthalmia neonatorum numbered 4359; they were up to the average, but total blindness resulted in only four. Puerperal sepsis and pyrexia with 8142 notifications gave 1006 deaths against 8431 notifications with 1212 deaths in 1934. Incidentally, it may be noted that these figures show that the Puerperal Pyrexia Order of 1926 is not being properly carried out, for the fatality of notifiable pyrexia (including fever) is not 1 in 8, nor in fact anywhere near it. There was no outstanding disease in 1935 and few epidemics of importance, though dysentery, the typhoids, and salmonella showed slight rises from the low levels of recent years, and there was a small crop of five cases of botulism, which is the second outbreak of the disease in British public health history.

EXPERIMENTAL EPIDEMIOLOGY

The importance of the work on experimental infections in herds of mice carried out by Profs. Topley and Greenwood at the London School of Hygiene and Tropical Medicine during the past 12 years has gradually obtruded itself more and more on our profession. With the inauguration of a special chapter of the report, dealing largely with this work, the subject of experimental epidemiology may be said, in the words of our gossip-writers, to have arrived. Based chiefly on the account of these experiments recently published,[3] a clear and charming description is given of the results and of the conclusions which may by analogy be inferred in human crowd infections. Put very briefly, these are: (1) That disease once introduced will not die out naturally as long as fresh immigrants enter the herd. (2) That survival of intense exposure to infection confers no absolute immunity on the survivors: the resistance acquired fluctuates widely. (3) That biological immunisation confers a slight advantage on the immunised in a bacterial disease (mouse typhoid) and a much greater advantage in a virus disease (ectromelia): hence in man environmental improvements rather than vaccination would appear to be the method of election in the prevention of disease such as enteric fever, while preventive inoculation would seem to be the more hopeful line of advance in virus diseases. (4) Secular variations in the course of herd mortality cannot yet be satisfactorily explained but the authors lean towards causes in the biology of the herd rather than in "cosmical theories of epidemic constitution."

Included in the same chapter of the report, though not coming so strictly under the heading, are accounts of studies on the spread of streptococcal infections, particularly of secondary infections by streptococci of a different type in cases of scarlet fever; and of epidemiology in country practice, based on the paper read by Dr. W. N. Pickles of Aysgarth to the section of epidemiology of the Royal Society of Medicine.[4] A plea is entered for similar valuable work to be recorded before the isolation of rural communities is completely destroyed.

[1] See THE LANCET, Oct. 31st, p. 1077.
[2] H.M. Stationery Office. Pp. 238. 3s.
[3] Medical Research Council, Spec. Rep. Ser. No. 209, 1936.
[4] See THE LANCET, 1935, i., 1276.

TUBERCULOSIS

The chapter on tuberculosis is the record of a year in which the incidence and fatality of tuberculosis reached low records surprising even to the sanguine, and to his study of this satisfactory material Sir Arthur MacNalty brings an unrivalled knowledge of the disease in all its bearings. The index, which is the crude death-rate from all forms of the disease per million living, sank to 718 from 763 in 1934, and the notifications to 55,148 from 59,564. Sir Arthur does not enlarge on the remarkable fall in tuberculosis, for he sees many ways in which our services can be improved to give still better results, and though last year's death roll of 26,854 is less than half what it was in the beginning of the century it is still an intolerable debt to a preventable disease. The standardised death-rate has fallen from 3478 per million in the middle of the nineteenth century to 687 in 1935 almost uninterruptedly and there seems to be no reason why the fall should not be continued. From the report it is clearly the writer's view that the fall will not continue of itself, but requires increased efforts to stimulate it. The tuberculosis service, he says, is "reasonably well organised" and proceeds to suggest ways in which it might be improved. There is no question of the soundness of the suggestions which can be inferred from his narrative, but the statement that 2540 of the new cases of tuberculosis in 1935 were not notified until after death may not bear the interpretation that its context implies. For how many of these were tuberculous meningitis and other forms of acute disease where the diagnosis cannot be verified until the patient is dying, or dead? Yet we must admit that the decline in notifications, though it keeps pace with decline in mortality, is "unsatisfactory in so far as it indicates that the service is not getting into touch with a materially greater number of patients in the earlier stages of the disease." The notifications and deaths suggest a much higher fatality than is actually the case. In the four years 1932–35, the dispensaries dealt with 262,000 patients, of whom 125,000 were suffering from tuberculosis. In the same years 117,000 persons died of tuberculosis. Though not all tuberculous persons do, or need, come under the dispensaries, it is obvious that a far larger number should do so and should come earlier, for but a small percentage of the population can afford to go through tuberculosis without the help of the official service. More intimate working of tuberculosis officers with general medical practitioners is required. This is generally stated as "increased assistance of practitioners" (Sir Arthur uses this expression) which suggests all take and no give, and is not an ideal relationship. When the tuberculosis service started, the vastness of its problems precluded our doing all that in those days we knew we ought to have done, but as the cases have shrunk to manageable numbers we should be able to do more for them, and certain provisions, such as efficient X ray instalments and machinery for lung collapse therapy, with experts to use them, which were not available twenty years ago, are reasonable expectations in every dispensary to-day. "No tuberculosis service," Sir Arthur says, "can to-day be regarded as entirely efficient which does not include adequate facilities . . ." He knows that not all have got them; the implied suggestion is that they should hasten to install them.

MATERNITY AND CHILD WELFARE

This chapter is the happiest one in the report. The lowest infantile mortality on record, and a maternal mortality which for the first time in recent years shows a substantial reduction, supply encouragement, and the Midwives Act, 1936, though it has not yet come into force, offers good food for hopeful speculation. Discussing the Midwives Act, Sir Arthur evidently expects the independent midwife to disappear and the whole of midwifery to become "an organised service . . . under the supervision of a superior officer. She (the midwife) will be an integral part of the public health service . . ." We believe this may, and in some districts will, happen, but the Act does not say that it must, nor does it give power to enforce it. The short reference to the maternal mortality question is sound and reasonable, although a longer commentary on the confidential reports on individual maternal deaths would have been welcome. The statement that in 50 per cent. of maternal deaths there is an avoidable factor is still awaiting explanation which can only come through the Ministry's scrutiny of these reports. It may be that in the sentence "it would be helpful if the investigator would more often indicate his conclusions as to any lack or inadequacy of service . . ." we find the reason why the reports do not offer material for settling the question. The prominence given to maternal mortality in the lay press has caused some fear in the popular mind that childbirth is too dangerous to be risked; Sir Arthur mentions this risk of fear and says truly "There is no need of fear." He could have added that since the publication of the departmental reports which raised the alarm the numbers of births has actually increased to the extent of causing a slight but appreciable rise in the birth-rate since 1933, and this in spite of the fact that the proportion of women capable of child-bearing in the population has fallen. It seems that though the propaganda may in part have been injudicious it has engendered rather more confidence than fear. The final sentence in the section on anæsthesia in normal childbirth (p. 64) runs "A midwife working alone cannot maintain asepsis, watch the progress of labour and deliver the child, and at the same time administer an anæsthetic." If this is intended to suggest that the use of the Minnitt apparatus is impracticable for midwives in the home it must have a profound bearing on the future of the midwifery service.

Small-pox at Oldham

In the past few days four cases of small-pox have occurred at Oldham. The first was that of an unvaccinated married woman, between 40 and 50, who worked in the cardroom of a cotton-mill in Chadderton. The other three are those of the woman's husband, who was vaccinated in 1916; her son, aged 15, who had never been vaccinated; and an unvaccinated woman who had been in contact with the original case. All these patients have been removed to hospital. The diagnosis of small-pox in the first patient was not established sufficiently early to ensure the successful vaccination of contacts, of whom there were at least 98 in the woman's place of work and 12 at her home, and arrangements have been made to keep them under daily supervision.

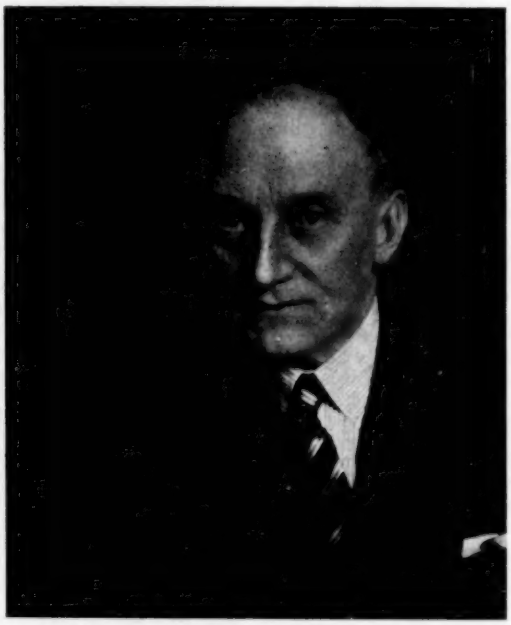
The original case was one of variola major, of rather severe type but not confluent. No human source of infection has been traced, and the infection was probably conveyed in the raw cotton which this patient handled. Cotton as a vehicle of infection of small-pox has frequently been suspected in the past, and in 1913 cases were reported in Oldham probably caused in this way.

OBITUARY

EDGAR HARTLEY KETTLE, M.D., F.R.C.P. Lond., F.R.S.

PROFESSOR OF PATHOLOGY AT THE BRITISH POSTGRADUATE MEDICAL SCHOOL

A VERY grave loss to British and indeed international medicine is caused by the untimely death of Prof. Kettle which occurred at his house in London on Dec. 1st. Always a delicate man, he had a serious operation some ten years ago from which, however, he made a successful recovery; but a recurrence of the symptoms two years ago necessitated a further operation which was again successful, though recovery was impeded by an unforeseen, and therefore unpreventable, complication. While obviously remaining in delicate health, his enthusiasm for, and high conception of, his duties at the Hammersmith school kept him in full work until the commencement of his short final illness.



PROF. KETTLE

[Photograph by Russell

Edgar Hartley Kettle was the son of Edgar Kettle, who married the daughter of Edward Hartley of Chipping Norton. He was educated at Skipton School, where the head master—a wrangler—was his uncle. His school-days were marred by a series of breakdowns owing to constant trouble in the knee, and at the age of sixteen he was admitted to St. Mary's Hospital, when the joint was excised by Edmund Owen. A curious reaction to environment then happened, for the patient told Owen that he had decided to go in for medicine. Owen's natural response—that he seemed particularly unfitted for such a career—gave Kettle, who was that sort of boy, as he afterwards became that sort of man, the exact stimulus to persevere in his intention. He entered St. Mary's Hospital, gained a scholarship, and during his course as a student received prizes. He passed the examination for the primary fellowship of the R.C.S., but never entered for the final examination, feeling that it was necessary to begin earning at once. He became temporary house surgeon at the French Hospital, being unqualified at the time, and there met J. A. Murray who interested him in cancer research. He had good grounding behind the impulse for pathological work, for while serving as clinical clerk and dresser at St. Mary's he had spent much time in the laboratory. He was appointed demonstrator in pathology at the hospital, and graduated M.B., B.S. Lond. in 1907. He remained for a further year as demonstrator and assistant pathologist, when, on the invitation of Alexander Paine, he went to the Cancer Hospital where a new pathological department had been built. He worked here for four years, finding opportunities during the last year to study continental methods in the laboratory at Freiburg under Aschoff. In 1912 he went back to St. Mary's as first assistant pathologist to the hospital, and assistant lecturer in pathology, later being joint pathologist with Sir Bernard Spilsbury, and finally coming into sole charge of the department.

He remained for twelve years at St. Mary's, years which included the war period, and Kettle felt bitterly that his stiff knee rendered him quite unfitted for active service abroad, but he discharged highly valuable duties at home. The laboratory at St. Mary's became the hub of the activities of a great school, this being specially marked as men came back on leave, and as the problems of the sick and wounded became urgent. He devoted himself to filling the gaps in the depleted staff, carrying on his work as pathologist, teaching the few remaining students, and acting for a period as resident obstetric officer. He considered that the practical insight thus acquired proved useful later in many directions. At the same time he was writing a book on the "Pathology of Tumours," which appeared in 1916. He was appointed consulting supervisor of the laboratory at the Third London General Hospital at Wandsworth, spending the mornings there and the afternoons and evenings at St. Mary's. At St. Mary's by this time, further responsibilities of teaching fell on him through the admission of successive batches of women students. He had, it may be said, been opposed to the policy of their admission in the first instance, as may be seen by his editorial articles in *St. Mary's Hospital Gazette*, but when the opposite decision was taken, both Kettle and the paper which he was editing gave the women a cordial welcome.

The ability for organisation displayed by Kettle at St. Mary's and elsewhere, no less than the scientific standard of his work, marked him out for advancement, and in 1924 he was invited to take up the position of professor of pathology and bacteriology at the Welsh National School at Cardiff. Here he had abundant opportunities to exercise the talents he had already displayed. The School was in a state of considerable disturbance at the time of his appointment, disputes—sometimes of an acrimonious character—having arisen between the University of Wales and the University College of South Wales and Monmouth as to the control of the medical

school. Both diplomacy and hard work were needed to establish friendly relationships and secure the necessary machinery for teaching the students; but by the time Kettle left Cardiff after a three years' tenure of his post, the school was established in new buildings, while the difficulties had been surmounted.

In 1927 there came for him the commencement of six years' work which he would often refer to as the happiest period of his life, for on the retirement of Sir Frederick Andrewes he was appointed to the chair of pathology of the University of London, held at St. Bartholomew's Hospital. He was unable to take up the appointment immediately for at this time he had a recurrence of the ill-health against which he had struggled all his life, but six months later he entered on his duties, and soon felt, in his own words, "part and parcel of Bart.'s." His high and tried qualities as teacher were at once appreciated. His acumen in and flair for research were demonstrated over and over again, while his admirable gift for friendship came into full play with colleagues and students alike. The wide vision displayed in dealing with pathological problems was found to be equally evident in his ideals of medical education, and in his views of the part which medicine ought to play in all public relations. The expert found in him one who could appreciate difficulties and find solutions; those in whom the spirit of research was being kindled looked immediately to him for guidance; while the students as a body saw in him a friend, as sympathetic with their play as with their work. He was elected president of the Students' Union, and was so certain of remaining at Bart.'s for the rest of his professional life that he presented his journals to the library.

In 1934 he was appointed professor of pathology at the British Postgraduate Medical School at Hammersmith, leaving St. Bartholomew's with great regret; he came to his new duties distinguished for researches into malignancy in all phases and silicosis, and also as a director of research. He proved to be an unqualified success in a post which carried with it great opportunities, but with the responsibility for devising a scheme of performance to meet very diverse requirements. Those entering on a course at the school would be doing so from many varying motives, and the school had to provide an inclusive programme to meet their wants—to give instruction from the latest angle and to resume accepted knowledge in its modern phases, and at the same time to pursue the paths of research, in themselves pointing in multiple directions. Thus there was required, especially at the beginning of the new undertaking, industrious supervision, careful discrimination in the choice of a staff, and a resolution and temperament which could recognise the aspirations and the difficulties of all concerned, colleagues and students alike. Kettle was immediately recognised as the ideal man for such a post; he created confidence and established unity of design, while recognising the part in a live concern that must be played by conflicting interests. His simplicity and good nature never interfered with his shrewd vision, and without a trace of pretentiousness or of professorial manner, he made it clear from the beginning that only a man's best would ever satisfy him.

Kettle's contributions to pathology were numerous and always valuable and pertinent—he never wrote with any idea save to advance knowledge. His first publication in 1912 dealt with carcinomatous metastases in the spleen. In the succeeding years he published many papers dealing with neoplasms of various types, among which his study of tumours rising from the endothelium deserves particular mention. In 1916 he published his classical monograph on the "Pathology of Tumours." In this book he collected and summarised general information on the subject of tumours in a succinct and readable manner, adding at the same time critical notes upon the more theoretical and speculative considerations. He presented the main theories of causation concisely, and in dealing with the experimental side of cancer gave an informing account of the work done up to that day in the study of transplanted tumours in animals. In the description of the various groups of tumour under accepted classification many illustrations were supplied, reproducing microscopic sections for the most part from specimens observed by himself, while the section devoted to special pathology in accordance with regional incidence was also fully illustrated. Money was short with Kettle during the war period, while his industry was unceasing. He typed the whole book out in the evenings, and, having studied Ford's technique of making drawings of microscope preparations, he executed all the beautiful figures himself. A second, and enlarged, edition was published in 1921.

His interests were not confined to this aspect of pathology. Almost synchronously with his first paper on malignant neoplasms, he recorded, in a conjoint paper in THE LANCET, his observations on the histology of experimental rheumatism; and, from the end of the war onwards, he devoted himself mainly to the study of the histopathology of infective processes, and particularly to those infections that could be studied experimentally in animals. He turned aside, from time to time, to study pathological processes of other types—his well-known paper on the Splenic Lesions in Some Cases of Splenomegaly Associated with Secondary Anæmia was, for instance, published in 1920, and he reported the occurrence of malignant change in a chronic duodenal ulcer in a paper in THE LANCET in 1930. But, from the day when he described the histopathology of gas-gangrene in the report issued by the Medical Research Council in 1919, he spent almost the whole of the time that he could devote to personal research work in the intensive study of various infective processes, and the influence on infection of various chemical agents, especially of silica. His earlier studies in this field, particularly in their broader aspects, are conclusively summarised in two papers on Inflammation and Infection published in THE LANCET in 1927. These illustrate very clearly the application of a method in which Kettle was a pioneer—the planned and deliberate use of histology as an instrument in experimental studies on animals as contrasted with its use for the elucidation of naturally occurring diseases in man.

His outstanding contribution to pathology was his study of silicosis and its relation to pulmonary tuberculosis. These investigations, on which he was still engaged at the time of his death, were recorded in a series of papers, the earliest of which was published in 1922, in collaboration with Gye, and the latest in 1934. In these reports the problem, in its various aspects, was developed systematically and in detail. In regard to the pathogenesis of the characteristic silicotic, or tuberculo-silicotic, pulmonary lesion, he was able, by an ingenious experimental technique in which various dusts, alone or in combination with killed tubercle bacilli, were injected intratracheally into guinea-pigs, to throw an entirely new light on the essential mechanism of the process. He found that the characteristic nodular fibrosis was readily produced by the combined action of the silica and the dead tubercle bacilli, but not by either reagent

acting alone. This accorded well with his extensive experience of the histopathology of silicosis in man, which had led him to place increasing importance on the infective factor. While not denying that a varying degree of pulmonary fibrosis may be produced in man by silica dust acting alone, he concluded that the development of silicosis as a clinically obvious disease is almost always dependent on an associated bacterial infection, very commonly tuberculosis, and that each factor must be regarded as enhancing the effect of the other. He suggested that the term "infective silicosis" would most accurately describe the nature of the disease.

Coincidentally with his study of the histogenesis of the silicotic lesion, Kettle was using the experimental technique he had developed to examine the pathogenetic properties of a large number of different industrial dusts, keeping steadily in view the social as well as the laboratory aspects of his problem. This side of his work brought him into close touch with the mining community, and with other industrialists. He served on the subcommittee of the International Labour Office which discussed this problem at Geneva; and was one of the official representatives sent from this country to the International Conference on Silicosis at Johannesburg in 1930. His directness of thought and exposition enabled him to make clear to laymen the essential scientific aspects of a problem with which they were deeply concerned; and his work in this field afforded an admirable example of the best type of coöperation between medical science and industry.

Kettle never underrated the difficulty of experiments of the type with which he was concerned. He never jumped to hasty conclusions, and he was one of those too few experimentalists who appreciate fully the importance of numbers, and the necessity for using adequate controls. His recent election to the Royal Society was more than deserved.

The summary of Kettle's life explains his outstanding success and accounts for the admiring and affectionate tributes to him which have reached us. Two of these we quote, each from a leading colleague. "Kettle," writes one, "caught and retained the interest of his students, and won the confidence and affection of all who worked with or under him. He established the friendliest and most fruitful relations with his clinical colleagues, and did his utmost to make the pathological department of which he was in charge an integral part of the hospital and medical school. At the same time he was insistent that pathology had a life of its own—a life that had to be respected; and he became quietly, but absolutely, immovable if anyone attempted to act in disregard of its just and proper interests. He had a wonderful flair for telling good work from bad, even in those branches of pathology of which he had little personal experience; and this enabled him to select as his assistants those who showed real promise. This faculty was admirably displayed during the last three years of his life, when he had the opportunity of building up the new department of pathology at the British Postgraduate Medical School. In the post-war years he served on many academic boards and scientific committees, and on all he did good service. He was wise in the true sense of the word; and his views, when he expressed them, carried great weight, in part because he never failed to give due weight to the views of others."

"It took years of intimate friendship with Kettle," writes another, "to fathom the extent and depth of his learning which was, to mere acquaintances, disguised under his jesting manner. His lightness of touch was surprising and the superb way in which he gave papers or contributed to discussion was based upon the exactitude of his knowledge and the precision of its arrangement. The last paper which he gave to the Pathological Society this year was equal to his best, though at the time his friends, who knew how ill he was, sat in apprehension. He could, in the nimblest way, prick pretentiousness, and always with a good humour which left no sting, while his kindness, generosity, and sure judgment in human affairs displayed him as an affectionate and loyal friend."

A third tribute contains these words whose exact truth we in this office know: "Few in his position had less of the great man in their manner but more of greatness in the way they worked and lived."

Prof. Kettle married in 1918 Dr. Marguerite Pam, who survives him and to whom all sympathy will go out.

JOHN THEODORE CASH, M.D. Edin., F.R.S.

Dr. Theodore Cash, who died on Nov. 30th at his house in Hereford at the age of 82, was an outstanding figure in pharmacology. He was Regius professor of materia medica in the University of Aberdeen for 33 years, retiring in 1919. A Manchester man, he took his medical course at the University of Edinburgh, graduated M.D. in 1879, and thereafter saw much post-graduate work in London, Paris, Vienna, and Leipzig. At Leipzig University he worked in the laboratory of the celebrated physiologist, Carl Ludwig. We owe to Prof. J. A. McWilliam the following account of his career.

"Before being appointed to the Aberdeen chair Cash had been closely associated in research work with Sir Lauder Brunton at St. Bartholomew's Hospital. At Aberdeen he was long a distinguished figure in the university and the city. He was the first pharmacologist to hold the chair; its former occupants, Harvey and Dyce Davidson, had been medical practitioners who had expended special attention on materia medica. From the first he devoted himself whole-heartedly to the welfare and advancement of his adopted university. A painstaking and effective teacher both in the lecture room and the laboratory, he was a keen researcher and a highly skilled experimentalist who made valuable contributions to medical science, among the most important being those concerning the nitrites and aconitine, published in the Philosophical Transactions of the Royal Society in 1894 and 1898, in addition to papers on other subjects in the *Journal of Physiology* and elsewhere. He received the F.R.S. so long ago as 1887, and later became LL.D. of Aberdeen and of Edinburgh. He was examiner at Oxford and for the Indian Medical Service. In the administrative work of the University of Aberdeen he took an active part, and he acted as dean of the medical faculty for a period of years; he also represented the university on the General Medical Council, and was a director of the Aberdeen Royal Infirmary in the work of which he was keenly interested. At one time he was president of the Aberdeen Medico-Chirurgical Society. In furthering the interests of the students he was always active—on the playing fields, on the river, and in their societies, especially their medical society.

"A keen sportsman, Cash's chief delight was in fishing, and he was a famous exponent of the art on Dee and Don and English and Irish rivers; his nocturnal achievements on the reaches of the Dee in good fishing weather were well known. The 'Prof.

Cash' salmon-fly has made his name widely known to devotees of the rod far removed from the walks of medicine; he also studied salmon disease. Some years before coming to Aberdeen Cash married a daughter of the Victorian statesman John Bright.

"Prof. Cash was a man of high public spirit, and he was endowed with an exceptionally keen sense of humour; a good 'mixer' he made many friends in different walks of life, by whom and by the large constituency of graduates who had studied under his guidance his memory will be cherished as that of a fine type of English gentleman who faithfully served his day and generation."

JOSEPH VAN SOMEREN TAYLOR, L.R.C.P., L.R.C.S. Edin., D.T.M. Liverp.

Dr. Joseph Taylor, who died recently at Thornbury, Bradford, was the son of Dr. Birdwood van Someren Taylor, a well-known medical missionary. He was born in Foochow in 1880, was educated at Manchester Grammar School, and proceeded for his medical studies to the University of Edinburgh. He took the double qualifications of the Edinburgh Colleges in 1904 and his first appointment was a medical officer at the Wakefield West Riding Asylum. He practised for a time at Grenada but in 1906 he obtained the D.T.M. of the University of Liverpool and came to Bradford. During the war he served in the R.A.M.C., was mentioned in dispatches and badly gassed in France. No doubt his experiences in the war permanently damaged his health, but none the less he lived the strenuous life of a successful general practitioner while he also took an active part in Bradford local affairs.

ALEXANDER MITCHELL, M.B., C.M. Edin.

Dr. Alexander Mitchell, a member of a family well known in Elgin and Aberdeen, died on Nov. 26th, having practised for some forty years in Old Aberdeen. Before entering medicine he served his apprenticeship as a bookbinder in Elgin, and, for a time, continued that vocation in Edinburgh, but, deciding to follow medicine, he entered the University of Edinburgh and graduated as M.B., C.M. in 1892. He then returned to Aberdeen and entered general practice where later he was joined in partnership by his brother, Dr. Peter Mitchell, upon whose death in 1929 he retired from practice. The brothers conducted one of the largest practices in the city, their long list of panel patients showing the public confidence which was reposed in them. Dr. Alexander Mitchell was a competent, genial, and charitable man, highly respected by those among whom he lived and worked. He had been in delicate health for several years.

JAMES ERNEST STRATTON, M.D. Lond.

Dr. James Stratton, whose death occurred on Nov. 30th as a result of an accident, was a well-known practitioner in Bermondsey and the district. He was born in 1876, and was educated at Wyclif College, Gloucester, whence he gained an entrance scholarship at University College Hospital, London. He graduated as M.B., B.S. Lond. in 1901, with honours in several subjects and was a gold medallist at the later examination for the M.D. He held house appointments at the Wolverhampton and Staffordshire General Hospital before settling in Bermondsey, where he came to hold a high position as a practitioner. He developed into an authority on the various forms of industrial disease present in Bermondsey and the environment, and was also prominent in much social work, being especially interested in education. He was chairman of the executive committee of the London branch of the Public Medical Service, and throughout his career showed himself a man of tried ability and fine character.

PANEL AND CONTRACT PRACTICE

Health Insurance, Remedial or Preventive?

AT a conference of the Insurance Institute of London held on Nov. 28th, the Minister of Health remarked that the national insurance scheme had marked a new conception in our social and health provisions. To-day, he said, we had another great conception—that our health policy and plans must be more positive in character, that it is not enough to protect the individual or the community from disease, but that we must more and more be health builders. To-day there were great opportunities for sound and constructive health work. Emphasis had been laid in the King's Speech on the importance of securing the improvement and expansion of many of our health provisions and services, and the Government regarded it as one of the most important parts of their programme during their period of office. Since the Act of 1911 was passed nearly £600,000,000 had been expended on benefits. The benefits had no doubt been a protection to our workers in time of sickness and disablement, but it should not be overlooked that the Act also charged its administrators with the task of assisting in the cure and prevention of sickness. Some headway in this direction had been made. There was dental benefit upon which £25,000,000 had been spent. Ophthalmic benefit was becoming increasingly popular; it had already absorbed some £4,000,000. Medical benefit was now to be extended to young persons under 16 years of age. All this to the good but there was one factor which demanded anxious thought; throughout the whole insured population there was a continuing rise in the claims for disablement benefit. In one of the largest societies in the country an analysis of claims in a particular week this year revealed the fact that of all the members receiving benefit in that week 45 per cent. had been in receipt of benefit continuously for over a year. It was difficult to reconcile this with the fact that the general health of the nation had substantially improved. The whole matter needed careful examination, particularly when it was remembered that increasing strain on the resources of the scheme must restrict its development in the direction of prevention and cure of disease.

Surgery Visitation Again

Two more insurance committees have been considering the question of waiting-room and surgery accommodation. West Sussex had a recommendation that a subcommittee should be appointed for each of the Chichester, Horsham, and Worthing districts to visit and report on the accommodation provided by practitioners. In response to a protest by medical members of the committee it was stated that there had been some complaints but they had been received some years ago—and the recommendation was lost.

(*Continued at foot of opposite page*)

CORRESPONDENCE

ŒSTRIN AND CANCER

To the Editor of THE LANCET

SIR,—The two letters on this subject in your last issue refer to experimental work on mice, and in the second letter Dr. Parkes, Dr. Bishop, and Prof. Dodds state that "œstrone will only produce an increase in the incidence of mammary and other carcinoma when injected in large quantities from birth onwards into susceptible strains of mice. It has been shown that even these massive injections into non-susceptible strains will not produce the development of mammary or other carcinoma."

I think these writers must be referring to part only of the original scientific literature on this subject, for the reports of Lacassagne do not seem to me to substantiate their statement. Lacassagne, in a series of experiments on susceptible and refractory strains of mice, directed towards determining the influence of a familial factor in the production of mammary cancer, used mice 18 days old. In his first paper [1] he records that cancer developed within 5–6 months not only in the female mice of highly susceptible strains, but also in males of the same strain in whom mammary cancer does not normally spontaneously appear. In a later paper [2] he records the fate of the mice used in this experiment belonging to strains regarded as relatively refractory to cancer (2 per cent. of cases). Two families survived. Of one family 50 per cent. developed cancer between the tenth and twelfth month, and of the second family 80 per cent. developed cancer between the tenth and fifteenth month, thus exhibiting a latent period which according to the reckoning of Dr. Cramer and Dr. Gye would correspond to a period of 5–10 years in man. The conclusion that œstrin preparations are potentially carcinogenic would seem inevitable from these reports.

With regard to the therapeutic application of œstrin "in the standard manner prescribed to-day," a study of the literature reveals no standardised method of determining the physiological requirements of each individual patient as in the case of insulin, and no common agreement as to dosage to be used; and reports of the results of treatment are extremely varied. The amount of the hormone in the blood varies; in the blood of patients of both sexes suffering from cancer it has been shown [3] that there is an excess of this hormone. What would be the effect of œstrin therapy in such cases?

In your issue of Nov. 28th Prof. Dodds is reported as saying at the Royal Society of Medicine that "the excellent results from the treatment of kraurosis vulvæ, *a precancerous condition*, was one of the most potent arguments in favour of hormone therapy." The italics are mine, for in this description of kraurosis vulvæ Prof. Dodds differs profoundly from the teaching on the subject in British text-books of gynæcology. Kraurosis vulvæ was first described [4] in a group of young married women with normal functions, and I have seen this affection not infrequently in women of an age within the reproductive period. It was therefore with grave concern I observed that excessive doses of œstrin over a prolonged period were advocated for treating kraurosis vulvæ, more especially in view of the recent experiments of Zondek [5] in which he has shown that excessive doses of œstrin injected into rabbits for a prolonged period cause destructive pathological changes in the uterus.

In conclusion I do not consider it can ever be called "unwarrantable" to inquire as to the possible risks for a patient in any form of treatment, and I would reiterate the opinion that the nature and effect of œstrin therapy as far as they are known should be explained, and the consent of the patient obtained, before injections are given.

I am, Sir, yours faithfully,

Welbeck-street, W., Dec. 6th. ELIZABETH HUNT.

[1] Lacassagne: Compt. rend. Soc. de biol., 1933, cxiv., 427.
[2] Ibid., 1934, cxv., 937.

(*Continued from previous page*)

Wiltshire considered a proposal that a joint committee—consisting of the chairman of the medical benefit subcommittee and a representative of the panel committee, with the clerk—should be appointed to hear any complaint made about accommodation and to confer with the practitioner concerned. Some means, it was suggested, should be found to ascertain whether there were grounds for complaint or not. A medical member recalled that a similar resolution—differing only as to the personnel of the subcommittee—had been passed by them some twelve years ago. This suggests that complaints cannot have been very frequent.

The Northampton insurance committee have appointed as their chairman Dr. David Stone, a retired practitioner, who has resided in the town for some 47 years. The Northampton county committee will also work during the ensuing year under the direction of a medical man in the person of Dr. A. R. Darley.

MORTGAGED PRACTICES

To the Editor of THE LANCET

SIR,—From time to time articles appear in medical publications dealing with the interesting and important question of the mortgaging of practices as a method of raising money for the purchase of such practices. Some of these articles give the impression to the casual reader that the new arrangement entered into by the British Medical Association with the United Dominions Trust satisfies a want which has hitherto been unsatisfied, and that the United Dominions Trust scheme has been put forward as the only way in which a medical man wishing to borrow money to buy a practice can be saved from going to undesirable lenders.

The recent article in THE LANCET (Oct. 10th, p. 875) avoided that mistake, for it drew attention to the fact that the new scheme was designed to meet the case of a doctor who found it necessary to borrow the whole of the purchase price of a practice and mentioned that certain reputable insurance companies had schemes to assist doctors, but that those were for the doctors who could and would put down a proportion of the purchase themselves. It is possible, however, that some people reading the article in a casual way might have gained the impression that were it not for the new scheme the position of doctors who possessed no capital was indeed a hopeless one. In actual facts we have had considerable experience of the mortgaging of practices even up to 100 per cent. of the purchase price and the insurance company

[3] Dingemanse, E., Freud, J., de Jongh, S. E., and Laqueur, E.: Arch. f. Gynäk., 1930, cxli., 225.
[4] Breisky, Zeits. f. Heilk., 1885, vi., 69.
[5] Zondek, B.: Jour. Exp. Med., 1936, lxiii., 789.

with whom we usually deal has given us complete satisfaction.

It is natural that, where possible, the insurance company would rather lend a proportion than the whole of the purchase price, but in suitable instances a 100 per cent. loan for 10 years is approved, and the treatment given by this company is not only courteous, but also very prompt—a very important factor. It would be a pity if doctors felt compelled to go to the United Dominions Trust subsidiary, for healthy competition is good, and when there is a choice of schemes it is often possible to get what more exactly suits the particular circumstances.

We have never had experience of the treatment of doctors referred to by you in your article, and we can say with confidence that all our clients have been treated generously and with every consideration.

We are, Sir, yours faithfully,

Birmingham, Dec. 4th. LEE AND MARTIN LTD.

THE IMPORTANCE OF SUGGESTION

To the Editor of THE LANCET

SIR,—The following is an illustration of the importance of suggestion upon both in-patients and out-patients treated at general hospitals.

This week a skilled carpenter was referred to me by his solicitor for an opinion as to his prognosis. The man had been very well treated in the surgical wards of one of the leading London hospitals for a fracture of the skull, and three weeks after admission it was found necessary to perform a trephine operation in order to stop the bleeding from a small vessel on the brain surface. The patient was able to give me accurate information regarding his various operations and treatment which agreed exactly with that which I had already received from other sources. I therefore asked him how he came to know so much about his condition and his reply was that he had read the notes of his out-patient record whilst waiting to see the surgeon from time to time in the out-patient department of the hospital.

The effect of this knowledge upon the patient has been to make him extremely apprehensive regarding his future. His apprehension, in my opinion, is not in any way due to a desire for compensation, for he has a wife and family and would be much happier at work than receiving 30*s.* a week, or any sum of money, as compensation for the injuries received as a result of the accident.

Would it not be possible for the proper authorities at all hospitals, especially those where medical students are being trained, to see to it that the out-patient records are not handled by patients but are placed direct upon the desk of the honorary physician or surgeon? A treatment card bearing the same number as the patient's history book can be given with safety to the patient and carried by him to the dispensary.

Some of your readers will have noticed a report in the press on an inquest held on Dec. 2nd at Hull, concerning the death of a mother of three children who had been handed a sealed letter by a hospital surgeon addressed to her doctor. Curiosity forced the woman to open the letter, and when she had read the same, which referred to her state of health, she was so distressed that she committed suicide. Could not such letters, sent to and from members of the profession to each other regarding their patients, be forwarded by post and not handled by patients at all?

The same principle applies to the discussion of patients' illnesses at the bedside. So frequently teachers of medicine seem to forget that the patient is a personality and not a case of a certain rare disease and that he is particularly keen to hear the discussion of his illness and of the possible diseases from which he might be suffering. Surely all teachers of medicine could at least withdraw to the end of the ward or to a room adjoining the ward to discuss the illnesses of their patients? In certain universities in America, for example at Yale University, all the records of the patients in the wards are kept in numerical order on a trolley which usually stands by the table of the sister in charge of the ward, so that entries can be made without difficulty by the nursing staff. The lower shelf of this trolley carries the usual instruments which might be required for the examination of patients during a ward round, and it is wheeled round the ward by a nurse. As far as I am aware this system is not generally employed in British hospitals, but it is one that could be put into effect at very little cost in all hospitals and is certainly worthy of consideration.

One is pleased to note the interest which is now being taken in the treatment and teaching of nervous diseases by many members of the medical profession, including the General Medical Council, who have made definite recommendations to the universities of Great Britain on this subject, and by Lord Horder who, in the *Times* of Nov. 30th, makes a strong appeal for adequate treatment of persons suffering from nervous disorders "by better education and by research that will lead to prevention." Perhaps the teaching hospitals could see to it that each contains a psychiatric department staffed by physicians with experience in psychiatry and neurology, not necessarily the medical superintendents of the nearest mental hospitals, although in many cases these physicians are quite capable of carrying out the work suggested.

I am, Sir, yours faithfully,

Brook-street, W., Dec. 4th. RALPH A. NOBLE.

WORK AS A REMEDY

To the Editor of THE LANCET

SIR,—In a leading article of Nov. 28th under this heading you remark that "the name 'occupational therapy' is not perhaps a fortunate one, but it is difficult to think of a better." Would not "recreation therapy" be a better term? The definition of recreation is "the act of recreating; refreshment of the strength and spirits after toil," and the definition of recreative is "giving new vigour or spirit."

I am, Sir, yours faithfully,

G. H. HARPER-SMITH.

Haywards Heath, Sussex, Nov. 28th.

DYE DERMATITIS OF EYELIDS

To the Editor of THE LANCET

SIR,—I am interested in Dr. Ingram's criticism of Dr. Semon's paper on dye dermatitis of the eyelids. Dr. Ingram suggests that in a case of sensitiveness of the skin, either acquired or inherited, to a substance the patch-test must be positive. I agree that this is what we usually expect, but while investigating a dermatitis of the hands in a worker in teak I applied patches prepared with teak dust on the interscapular region and on the left upper arm. I obtained a positive result on the arm but was rather surprised that the result on the shoulders was negative. I am still unable to explain this apparent local sensitiveness of the skin, but I think these results show that a patch-test in one portion of the skin may not necessarily be positive in a true case of sensitiveness.

I am, Sir, yours faithfully,

Manchester, Dec. 4th. ALEX. R. SOMERFORD.

GRAINS AND SCRUPLES

To the Editor of THE LANCET

SIR,—I have been interested and amused by reading the first section of the contribution of "A Chronicler" to your Grains and Scruples series. It may be that some readers of THE LANCET will find it convenient to know which of the classics mentioned have been rendered into English. Of one of them only are there several translations, and they are not all equally easy to obtain. Below I give a list which may be found to be of some use.

There is no complete translation of the Works of Galen, but the section On the Natural Faculties has been translated into English by A. J. Brock, in the "Loeb Classics," 1916.

The Works of Hippocrates have been translated into English by W. S. Jones and E. T. Withington in the "Loeb Classics," 4 vols., 1923–31.

The Works of Celsus have been translated into English by J. Grieve, 8vo, London, 1756; by J. W. Underwood, 2 vols., 1831; and by W. G. Spencer in the "Loeb Classics," vol. I., 1935. Vol. II. is not yet published.

Of the Works of Rhazes, there is no complete translation into English, but the Treatise on Small Pox and Measles, to which allusion is made by "A Chronicler," has been translated from Arabic into English by Dr. W. A. Greenhill, for the Sydenham Society in 1848.

I am, Sir, yours faithfully,

ARNOLD CHAPLIN.

York Gate, N.W., Dec. 7th.

TESTOSTERONE PROPIONATE AND THE PROSTATE

To the Editor of THE LANCET

SIR,—Dr. Browdy has been unfortunate in his use of androsterone in the treatment of enlargement of the prostate (THE LANCET, Dec. 5th). We feel, indeed, that he has been unusually so, for unless information has been wilfully withheld by others who have written on this subject, his experience must be unique. We also feel that it is not too much to ask that he be possessed of knowledge of the use of testosterone propionate before he defines how it should be used. During the past three months we have studied ten patients who are being treated with testosterone propionate for enlargement of the prostate. At first these patients were given either 5 or 10 mg. testosterone propionate twice weekly. Most of them are now receiving 40 mg. a week in one injection. In no single case have any adverse effects followed the injections, and in almost every case the treatment has already yielded some success. We are not yet prepared to discuss the specificity of this success, but regarded purely on the basis of male-hormone potency (as determined experimentally[1]) 40 mg. of testosterone propionate is equivalent to about 200 times the amounts of androsterone Dr. Browdy used, even assuming that he injected 20 capon units of androsterone (=2 mg.) daily. Four patients also received testosterone in amounts which exceeded in potency the doses used by Dr. Browdy. In no single case, again, were the injections followed by any adverse effects.

The patients in our series are being injected once weekly, because there already is ample evidence that the biological effects of testosterone propionate are prolonged far beyond the time of its administration.[2] It would be useful to have information about the rate of the hormone's excretion, but whatever its nature, this information could not invalidate, and could only strengthen, this view about the prolongation of the hormone's effects. In any case it is preferable to continue basing treatment on biological facts, rather than to limit treatment on the basis of Dr. Browdy's speculations. Indeed, it would seem to be stretching the legitimate bounds of speculation unduly to suppose that 20 capon units of androsterone would cause, as Dr. Browdy suggests, enough congestion in an enlarged human prostate to lead to urethral bleeding. Such an amount has no obvious immediate effect on the vascularity of the prostate of a small monkey, and about 3000 units injected in single doses have failed to cause any urethral bleeding in monkeys. Even though the vascular conditions in an enlarged human prostate may be different from those of a normal prostate, it is not unreasonable therefore to ask that Dr. Browdy should also seek in some other direction for an explanation of the urethral bleeding that followed his injections.

Finally, we should like to point out that although the amounts of testosterone propionate given to the patients we are studying were primarily based on data supplied by experimental work on monkeys, the clinical results obtained encourage us to increase rather than to diminish them. Furthermore, we feel strongly that in the present state of ignorance, male-hormone therapy should be guided by experimental studies, rather than by no studies at all. When information has accumulated about the clinical use of male hormones, it will be time enough for the reactions of experimental mammals to these substances to be disregarded in medical practice.

We are, Sir, yours faithfully,

S. ZUCKERMAN,
RAYMOND GREENE.

Department of Human Anatomy, University Museum, Oxford, Dec. 7th.

[1] Deanesly, R., and Parkes, A. S.: Biochem. Jour., 1936, xxx., 291. Miescher, K., Wettstein, A., and Tschopp, E.: Ibid., 1936, xxx., 1977.

[2] Miescher, K., Wettstein, A., and Tschopp, E.: Schweiz. med. Woch., 1936, lxvi., 763. Parkes, A. S.: THE LANCET, Sept. 19th, 1936, p. 674. Zuckerman, S.: Ibid., Nov. 28th, 1936, p. 1259.

REACTIONS TO ANAHÆMIN

To the Editor of THE LANCET

SIR,—In your last issue Dr. Hales describes reactions to anahæmin in two cases of anæmia. In my experience the original anahæmin resembled other liver extracts in that transient flushing or dizziness not infrequently followed its injection intramuscularly or intravenously, disturbances such as urticaria, bronchial spasm ("asthma"), or even temporary cardiac syncope in isolated instances. Whether such reactions will cease to occur when the liver principle is available in a state of complete purity it is not yet possible to state. A paper describing further purification of Dakin and West's fraction and the results obtained with the more purified product is at present in the press. In the past five months, during which the purer preparation has been administered to 102 cases of pernicious anæmia, either to induce or to maintain a state of remission, no reactions have been observed.—I am, Sir, yours faithfully,

Newcastle-on-Tyne, Dec. 5th. C. C. UNGLEY.

NEEDS OF ELDERLY NURSES.—At a meeting of the Elderly Nurses' National Home Fund the Bishop of Southampton asked for support for this effort to provide old nurses with comfortable homes. The sum of £5000 is needed before the building can be started and another £15,000 for endowment.

INTERNATIONAL SOCIETY OF UROLOGY

(FROM OUR VIENNA CORRESPONDENT)

THE meeting of this society concluded the series of medical congresses held this autumn in Vienna. The delegates to the congress were given a cordial reception by the municipality, by the leading officials of the Government, and by the Vienna medical faculty. Prof. Viktor Blum (Vienna) presided, and the convention lasted for three days; each day was devoted to papers on a single topic in German, English, French, Spanish, or Italian.

CARCINOMA OF THE PROSTATE

The introductory paper was presented by Dr. T. Hryntschak, who discussed the pathogenesis and histology of prostatic cancer. He said that the problem, whether cancerous degeneration took place in the myoglandular hyperplasia of the prostate or in the gland tissue itself, had not yet been solved. In collaboration with Dr. Theodor Bauer he had found that of 310 operation specimens 3 per cent. showed cancerous changes not suspected clinically, and 7 per cent. had precancerous lesions. In very many cases of hyperplasia a focus of regeneration was found. Their researches proved beyond doubt that cancerous degeneration took place not only in the hyperplastic parts of the prostate but also as a result of inflammatory processes in the gland itself. Carcinoma occurred twice as often in this part as in the hyperplastic tissues.

A paper was then read by Mr. C. A. R. Nitch (London) on the conservative treatment of carcinoma of the prostate, which, he said, comprised radiotherapy or operation, or both combined. The immediate results of X ray treatment were often excellent, but the ultimate results were disappointing. The five-field maximum method of Holfelder-Reisner and Levitt's intensive split-dose method were suitable, but only 6 per cent. of complete cures had been claimed. Radium gave better results, especially when applied in large doses of about 70 mg. to the rectal (14 mg.), vesical (50 mg.), and urethral (6 mg.) surfaces of the prostate. Conservative surgery consisted of suprapubic drainage, transplantation of the ureters, and electro-resection, which was the best palliative measure for the relief of obstruction at the neck of the bladder.

The third contribution was a paper by Prof. Oreja (San Sebastian, Spain) which was read by Dr. Hryntschak because its author was prevented from coming by the war in Spain. Prof. Oreja said that early diagnosis was important if a radical cure was aimed at. He stated that 20 per cent., or perhaps even more, of all cases of prostatic obstruction were of cancerous origin. Rectal palpation and radiographic examination of the skeleton were of the greatest importance for early diagnosis, especially in men over 50. He thought the best results were obtained when operation was performed only in suspected cases—i.e., when rectal palpation revealed small suspicious nodules, or when diagnosis was doubtful. If, however, the diagnosis was certain, he thought it better to abstain from radical operation. In such cases he believed that trans-urethral resection would render great help and in the near future might abolish suprapubic cystotomy.

RENAL SUPPURATION

The second day was devoted to the discussion of the problem of suppuration in the parenchyma of the kidney. Dr. Hugh Cabot (Rochester, U.S.A.) presented a paper on the blood-borne pyogenic infections of the kidney. The organisms, the pyogenic cocci, he said, appeared in the urine early in the disease, but disappeared as a rule in a few days, though occasionally they persisted for several weeks. The lesions were primarily cortical and medullary, but sometimes a massive renal carbuncle or a perinephric abscess developed. Radiography was a valuable addition to the classical methods of diagnosis. For the fulminant cases operation was alone available, but the other acute cases, with rigors, hyperpyrexia, and leucocytosis, might recover under medical treatment, with careful observation of the patient's reaction. In subacute cases operation was only indicated when perinephric abscess developed. The types of operation he advised were nephrectomy in fulminant cases and in widespread infection without abscess, if the patient was losing ground, decapsulation with drainage in carbuncle; while perinephric abscess required exploration, which would determine the sort of operation needed.

Prof. Geza Illyés (Budapest) discussed all types of suppuration of the renal parenchyma without considering their ætiology. He differentiates three modes of infection: hæmatogenous (descending), urogenous (ascending), and lymphogenous. The resulting infections were: suppurative nephritis, for which he recommended nephrectomy, sometimes preceded by decapsulation, which alone was often effective; suppurative pyelonephritis (the commonest type, containing the ascending infections), in which treatment should be conservative, if possible; and pyonephrosis, which was the final result of renal suppuration, was to be treated radically.

The third paper, communicated by Dr. Necker, had a wider scope, dealing with renal suppuration, the result of all types of non-specific kidney infections. Experiments, he said, tended to show that cocci preferred the cortex and the colon bacilli the mucosa. In the former, suppuration of the parenchyma was primary, in the latter it was the final stage. The blood picture and the sedimentation-rate were valuable aids to diagnosis, and pyelography might answer accurately many questions. He advocated expectant treatment for a short time only, to be followed by decapsulation, incision, or excochleation, which would often be sufficient. Even very serious cases might improve with continuous catheterisation, with cystotomy, or with continuous drainage of the ureter, but often nephrectomy was necessary.

THE SECRETION OF URINE

The third and last day of the convention was devoted to the physiology and pathology of the renal excretion. Prof. Pisani (Milan) described a renal excretion and a bladder excretion, and pointed out that there were transitory and permanent, acute and chronic, excretory disturbances both of motility and of tone, as well as of a mixed type. Chronic disease might often be neutralised by compensatory processes, but this could not hold out indefinitely.

Dr. H. Rubritius read a paper on the physiology of the efferent urinary channels. He pointed out that the muscular walls of hollow organs had zones acting as sphincters, and others as detrusors; with the contraction of the detrusor the corresponding sphincter relaxed. While the bladder contracts,

therefore, the peristalsis of the upper urinary tract ceases, a mechanism regulated by reflexes. Any disturbance of this would cause a vesico-ureteral reflux or upward flow. The mucous membrane of the urinary passages, he said, was capable of considerable resorption, especially in the fornix calicis, and the undisturbed coöperation of the kidneys and the urinary passage was ensured by the interaction of these organs.

The third and last report presented by Prof. I. Snapper (Amsterdam) dealt with the pathology of urinary secretion. This, he said, was formed by the combined action of different physiological processes in the kidney, glomeruli and tubules having completely separated functions of excretion and absorption respectively. Filtration in the glomerul depended upon the local as well as the general blood pressure, upon the composition of the blood plasma, and also upon the innervation of the kidney. Urine, he went on, was a supersaturated solution of many substances, some of which were otherwise practically insoluble. This had an important bearing on stone formation, and Prof. Snapper discussed the hydrotropic action of different organic constituents of the urine.

PARLIAMENTARY INTELLIGENCE

HEALTH CONDITIONS IN OFFICES

ON Dec. 4th in the House of Commons Mr. AMMON moved the second reading of the Offices Regulation Bill. It was similar, he said, in all respects to the measure which was brought before the House in March last (see THE LANCET, 1936, i., 695). They were told that the Public Health Act, which was then under consideration, would very largely meet the needs that were declared in the Bill itself. But the Public Health Act in this connexion had no relation whatever to London or to Scotland, places where, if anywhere, there was the greatest need for legislation with regard to office control and supervision. Although in the last debate the Minister said that the Consolidation Act would to a large extent overcome many of the difficulties and make the Act operative, it did not do anything of the sort, because unless the Government took steps through the Ministry of Health to bring pressure upon the local authorities, the law was likely to be a dead letter. This Bill was pressed forward in the hope that legislation similar to that which was being well carried out in regard to factories might be extended to office workers. The importance of this legislation was emphasised by the fact that there were 4,250,000 persons concerned.

Mr. RAIKES moved the rejection of the Bill. He said that the fact that there had not been time to allow the Public Health Act to produce its results was a conclusive argument against bringing a Bill of this kind forward twice in the same year. Some of the provisions of the Bill were already definitely covered by the Public Health Act. If they adopted the figure of 400 cubic feet per person proposed in the Bill they would automatically close at once a very considerable number of the best offices in London. He was prepared to admit that the existing law had not been made full use of. If that had been done the law would have covered practically every case quoted in the House since 1934 in regard to bad conditions in offices.

Mr. WAKEFIELD seconded the motion for the rejection. He said that the Public Health Consolidation Act which was passed last session went further and was more suitable for the purpose than the proposals contained in this Bill which would be merely redundant legislation.

Sir FRANCIS FREMANTLE said he had been active in pressing forward and insisting upon some similar provisions to those contained in this Bill for the last 14 years, but the legal position was obscure. Some medical officers of health were taking it for granted that they had power to inspect offices, and it was not disputed. The result in those cases was satisfactory on the whole. Other medical officers were not taking such action because they felt they had not the powers or that the law was doubtful; at any rate they gave good reason for not carrying out the inspection that was certainly needed. It was therefore decided to have a test case, but though year after year he questioned the Ministry of Health about the test case it never came off. He thought it was decided that what must be done was to get some definite legislation to establish the position They had therefore had several Bills for office regulation. A Bill on very similar lines to the present Bill was brought forward in 1926. The Royal Sanitary Institute thought that some such provision was necessary but that the Bill was unnecessarily onerous. But its provisions were almost word for word incorporated in the Public Health Consolidation Act which was passed last session, and it seemed to him redundant except in so far as this Act did not deal with London. As to the view that the conditions of the Bill were unnecessarily onerous, there was no question that in a large number of cases underground or internal offices had proper ventilation arrangements, although of course supervision of these premises was required. Everyone knew that the condition of many of them was scandalous. Medical officers of health stated that they had not received many complaints, and the Ministry of Health gave that as one ground for inaction some years ago. The reason however was obvious. Clerks or typists did not feel able to make complaints which would certainly be set down against them. It seemed clear enough that a great deal more needed to be done, but there was no need to be scared by exaggerated statements. Statistical fallacies in regard to ill health in offices arose from the fact that they had not an equally healthy population to deal with at the beginning. Still there was need for the provision indicated in the Bill, although he believed it would be made a necessary condition in London by the Public Health Consolidation Act.

THE HOME OFFICE VIEW

Mr. GEOFFREY LLOYD said that the Government were in sympathy with the general objects behind this Bill, but they were surprised that it should have been introduced again so soon after the assurance he had given that the Public Health Bill then in draft would meet a large number of the points. The undertakings he then gave had been fulfilled; the Public Health Act had now been passed. The House would not wish to impose onerous new provisions and restrictions on any section of the community unless they were sure that they were required and were not already covered by existing legislation.

The Registrar-General had supplied him with figures regarding the mortality-rates among office workers. The rate for male clerks who were civil servants was 15 per cent. below the male average up to 45 years of age, and their advantage thereafter became progressively greater, exceeding 40 per cent. after the age of 65. The cause of this advantageous mortality-rate he believed to be the high physical standard of the Civil Service at recruitment. It was not a question of the effect of office conditions. The mortality-rate of male clerks outside the Civil Service at the ages of 25 to 45 was about the same as that for males as a whole. Thereafter they exhibited a mortality about 5 per cent. higher. The question of phthisis was rather important in both groups. In the Civil Service the excess in mortality in regard to phthisis was confined to the age-group from 35 to 55, and it seemed probable that this excess, amounting to

about 50 deaths in three years, was a delayed outcome of admission to this occupation of many unfit or invalided ex-Servicemen after the war. The mortality from phthisis among clerks outside the service showed a slight excess which would be accounted for if only one out of every 100 phthisical persons in the country entered clerical professions. There was a tendancy for persons in a phthisical condition to find their living in the clerical profession. At the same time he did not think it would be wise to assume that the position was all against the clerical male worker, because the excess from phthisis was about equal to the decrease in mortality from accidents to clerks as compared with the general body of the population. It was true also that they had a relatively high mortality-rate from angina pectoris and digestive diseases. That was offset by the low mortality from bronchitis and pneumonia.

The mortality-rates of single women engaged in clerical occupations compared very favourably with those of other single women of all ages, being in most cases about 70 per cent. of the average level. This was an interesting point, because the reasons that led women to go into clerical occupations were rather different from those that led men to enter those occupations. Men had a far greater range of occupations open to them at present, and therefore there was more likelihood of those with a particular physical weakness such as phthisis to enter occupations which were less hard; whereas with regard to women clerical occupations were just one of their normal main activities. Therefore the fact that in the case of women the mortality-rates were favourable went to show that a factor of prime importance was the physical conditions of the entrants into the occupation. Even in the higher aged group of women engaged in clerical occupations they still had very favourable mortality-rates, and with women who all their lives had spent their time in offices there was no indication that the mortality-rates were unfavourably affected by their having worked in offices. But of course he agreed that the conditions in offices ought to be as good as possible.

Mr. Lloyd said the Minister of Health had informed him that he intended in a circular to call the special attention of local authorities to their clarified powers under the Public Health Act and to the necessity for enforcement. The London County Council had expressed their intention of bringing in an amending Bill to bring the law in London into proper relation to the Public Health Act. In regard to Scotland the Secretary of State took the view that the present law in Scotland relating to health conditions in offices was much the same as the law in England as contained in the Public Health Act, 1936, and that the more important parts of the present Bill were met by existing statutes. Further, the report of the Committee on Scottish Health Services recommended the institution of a new sanitary code for Scotland, and the committee's recommendations were at present being considered with a view to appropriate action. The Secretary for Scotland intended to ask the Department of Health for Scotland to issue a circular to Scottish local authorities drawing attention to the Public Health (Scotland) Acts in their application to the regulation of offices and the desirability of the enforcement of their powers in this connexion.

He wished, Mr. Lloyd concluded, to emphasise the profound alteration and improvement which was made by conferring the right of entry on inspectors of local authorities. As those powers were exercised they would begin to accumulate a considerable body of authoritative information as to conditions in offices which did not exist at present.

The motion for the rejection of the Bill was carried by 169 votes to 114.

VARIOLA MINOR AND VACCINATION

In reply to a question put by Mr. GROVES to the Minister of Health as to how many deaths occurred amongst the 11,930 unvaccinated, and 1756 vaccinated, cases of variola minor, respectively, treated in the small-pox hospitals of the London County Council during the years 1928 to 1934; what were the ages of the fatal cases in question; and what were the ages of the fatal cases which were vaccinated or revaccinated after exposure to small-pox, Sir KINGSLEY WOOD gave the following particulars.

Unvaccinated cases: 23 deaths. Their ages were as follows:—

Age.	Cases.	Age.	Cases.
2 days	1	10 years	1
3 „	1	11 „	1
12 „	1	13 „	1
17 „	1	17 „	1
3 weeks	2	45 „	1
4 „	1	56 „	1
5 „	1	58 „	1
7 months	2	59 „	1
2 years	2	69 „	1
5 „	1		23
7 „	1		

Of these 23 fatal cases, 11 were vaccinated for the first time after exposure to infection. Their ages were as follows:—

Age.	Cases.	Age.	Cases.
3 days	1	2 years	1
12 „	1	5 „	1
3 weeks	1	13 „	1
4 „	1	58 „	1
7 months	2	59 „	1

Vaccinated cases: 11 deaths occurred among the vaccinated cases. Their ages were as follows:—

Age.	Cases.	Age.	Cases.
37 years	1	56 years	1
45 „	1	63 „	1
46 „	2	66 „	1
50 „	1	69 „	1
53 „	1	79 „	1

Of these 11 fatal cases, all of which were vaccinated in infancy, 3 had been vaccinated for the second time after exposure to infection. Their ages were as follows:—

Age.	Cases.	Age.	Cases.
50 years	1	79 years	1
63 „	1		

MEDICAL OFFICERS OF HEALTH AND PRIVATE PRACTICE

In the House of Lords on Dec. 8th Lord MERTHYR asked His Majesty's Government how many county councils in England and Wales had failed to formulate arrangements for securing that medical officers of health should not engage in private practice as medical practitioners in accordance with the provisions of Section 58 of the Local Government Act, 1929, and of Section 111 of the Local Government Act, 1933; and what steps were proposed to be taken for ensuring the observance of the law by such councils; and moved for papers. He said that Medical officers of health would be the first to admit that they were not supermen and that they could not serve at one and the same time two masters whose interests frequently conflicted. If the interests of a medical officer's private patients conflicted with the interests of his medical authority it was only natural that the interests of his patients would be placed first and that of the authority last. Specialists were required in local government nowadays as in other walks of life, and it should be necessary for a medical officer to know only the barest details of surgery, while on the other hand he ought to be steeped in the law of public health.

Viscount GAGE, Lord in Waiting, said that 27 county councils in England and Wales had so far failed to complete the formulation of such schemes, but it would be a mistake to deduce from those figures that there had been a serious breakdown of the administrative machinery. The principal cause of the delay was that certain counties had not completed the reviews of the county areas that was initiated in 1929. Relations between the Ministry and the local authorities had got to be maintained with discretion. The Minister of Health fully appreciated the importance of compliance with the requirements of the section of the Act as early as possible, and as soon as the reviews had been completed he would draw the attention of the county councils to their statutory obligation. Despite appearances to

the contrary, the Minister of Health was satisfied that the majority of the 27 county councils which had not yet formulated their schemes were taking steps to do so, and in the case of only three councils did it appear that failure had arisen. He would use his powers in regard to those which continued in an attitude of non-compliance. The county councils remained responsible for making these arrangements, even though they might not have come to an agreement with other authorities within their area, although, of course, it was desirable that such agreements should be reached as soon as possible. The formulation of a scheme did not mean that no part of that scheme could be afterwards changed.

It had been argued that the appointment of a whole-time medical officer to cover a district at present served by several part-time officers must be delayed until all the part-time officers had finished their contractual periods of engagement. To overcome the difficulty provision was included, in regulations issued by the Minister of Health last year, to limit the appointment of medical officers who were not restricting their practice to a period of not more than a year at a time, and a similar limitation of period of appointment had been imposed by administrative action in such cases. It was hoped by this way to facilitate the appointment of medical officers of health restricted from private practice. The programme would be rather slow, but it was proceeding steadily. It was never contemplated that the reform should be carried out in a short time provided that progress was steady.

QUESTION TIME

THURSDAY, DEC. 3RD

Special Areas Bill

Mr. LAWSON asked the Minister of Labour if it was the intention of the Government to introduce an amended Special Areas Bill, and when it would be introduced.—Mr. ERNEST BROWN replied: It is hoped that the proposed Bill to amend the Special Areas (Development and Improvement) Act, 1934, will be introduced soon after the House meets in January.

Women Regional Medical Officers

Mr. HOLLINS asked the Minister of Health whether he was aware that it was the general practice of approved societies to send all their married women who applied for benefit under the National Health Insurance Act to the regional medical officers before any payment of benefit was made; and whether he would consider the appointment of lady regional medical officers to examine all women who might be sent to them by approved societies.—Sir KINGSLEY WOOD replied: Where an approved society is in doubt as to the incapacity for work of any member claiming sickness or disablement benefit, it is entitled to refer the member to a regional medical officer for a second opinion, but I cannot agree that it is the general practice of societies to take this step in the case of all married women who apply for benefit. The regional medical staff already includes some women, and all vacancies on the staff are open to qualified women applicants equally with men, but I have no reason to think that there is any general desire that all insured women referred to the regional medical service should be examined by women.

Water Resources: A Central Advisory Committee

Miss WARD asked the Minister of Health whether he had considered the report of the joint committee on the reorganisation of the water-supplies of the country; and what action he proposed to take in the matter.—Sir KINGSLEY WOOD replied: I have considered this report. I cannot hold out any prospect of water legislation this session, but I have decided, as a first step, after consultation with the other departments concerned, to set up a central advisory water committee. The terms of reference and constitution of the committee are now being formulated.

Malarial Treatment for Paralysis of the Insane

Mr. SORENSEN asked the Minister of Health whether he could give the number of patients in mental hospitals during each of the past five years who had received malarial treatment for general paralysis of the insane; and how many of such patients were deemed to have recovered as a result of such treatment.—Sir KINGSLEY WOOD replied: The numbers of patients in mental hospitals who have received malarial treatment during the last five years for which particulars are available are as follows:—

1930	*1931*	*1932*	*1933*	*1934*
702 ..	737 ..	690 ..	639 ..	646

Over 10 per cent. of those treated in each of these years were discharged "recovered" within the year. Complete information is not at present available as to the total number of recoveries among those treated over the period of five years.

County Councils' Health Services

Mr. GEORGE GRIFFITHS asked the Minister of Health whether he would give a list of the county councils which had under the Local Government Act of 1929 transferred from the public assistance committee to the appropriate committee of the council their powers under the following Acts, respectively: the Public Health Acts, the Mental Deficiency Acts, the Maternity and Child Welfare Act, 1918, and the Tuberculosis Act, 1921.—Sir KINGSLEY WOOD replied: The following county councils have made declarations under Section 5 of the Local Government Act, 1929, that certain assistance is to be provided exclusively by virtue of the Acts referred to in the question, and not by way of poor relief:—

Public Health Acts.—Nil.

Mental Deficiency Acts.—East Sussex.

Maternity and Child Welfare Act, 1918.—Cheshire, Hertford, and East Sussex.

Tuberculosis Act, 1921.—Hertford, Lincoln (parts of Holland), and Rutland.

Cost of Meals for School-children

Mr. MAINWARING asked the President of the Board of Education the total money cost to local authorities, within distressed and special areas of the country, for the provision of meals and other nourishment to school-children during each of the last four years.—Mr. OLIVER STANLEY replied: The following Table gives the net expenditure on the provision of meals, milk, and other supplementary nourishment during the years in question of all the local education authorities in England and Wales whose areas are wholly or partly special areas as defined in the First Schedule to the Special Areas (Development and Improvement) Act, 1934. Fifty per cent. of this expenditure is met by grants from the Board of Education:—

Year.	Net expenditure.
1932–33	£98,619
1933–34	£115,040
1934–35	£117,572
1935–36	£116,004

The slight decline in the expenditure during the financial year 1935–36 is due to the reduction in the price of milk under the milk in schools scheme which came into operation on Oct. 1st, 1934. The number of children receiving free meals or milk was greater in 1935–36 than in 1934–35. The figures are confined to the special areas, and there is no precise definition of distressed areas as distinct from special areas.

MONDAY, DEC. 7TH

Post Office and Patent Medicine Advertisements

Mr. CARY asked the Postmaster-General what annual revenue was derived, directly or through a contractor, for advertisements in books of stamps; what portion of the revenue so obtained was derived from advertisements of medicines and appliances for the cure or relief of rheumatism and arthritis and of deafness, respectively; and whether, in view of Paragraph 57 (2) of the Report of the Select Committee on Patent Medicines in 1914 recommending the prohibition of advertisements of cures for deafness, among other diseases, it was his practice to consult the Minister of Health respecting such advertisements.—Major TRYON replied: The figure asked for in

the first part of the question is £16,493, and those asked for in the second half are £838 and £3074. The answer to the third part is in the negative, but the Minister of Health is aware of the general policy of the Post Office.

Alcohol and Road Accidents

Mr. MESSER asked the Minister of Transport, whether he was aware of recent experiments and investigations at the National Institute of Industrial Psychology, the conclusions of which had still further enforced the findings of the British Medical Association on the relation of small doses of alcohol and unreliability in motor driving; and if he would take steps, in view of the toll of road accidents, to bring this matter prominently once more to the attention of the motoring public.—Captain A. HUDSON, Parliamentary Secretary to the Ministry of Transport, replied: Yes, Sir, the Institute furnished me with a copy of the report of a preliminary study of the relation of alcohol to road accidents, based upon a series of experiments, the results of which are stated to indicate that even moderate quantities of alcohol tend to make a driver accelerate unconsciously and maintain a less steady course. The report received considerable notice in the press, and I do not doubt that the hon. Member's question will serve to draw further attention to it.

TUESDAY, DEC. 8TH

Remuneration of Women Medical Officers

Mr. KELLY asked the Financial Secretary to the Treasury why women doctors in Government employment received remuneration equal to that of their male colleagues, and why such equality was not recognised in respect of any other branch of scientific workers.—Lieut.-Colonel COLVILLE replied: The policy underlying the general practice of differentiating in the pay of men and women civil servants in the same grade was explained by the Prime Minister in the debate on April 6th last. Differentiation was made in the case of women scientific workers in accordance with the practice described on that occasion. Women medical officers are in a special position, in connexion with that practice, in view of the well-established outside custom of giving the same scales of pay to men and women in the case of medical appointments for which both sexes are eligible.

Milk-in-Schools Scheme in Scotland

The Duchess of ATHOLL asked the Secretary of State for Scotland the total number of children in primary schools in Scotland; and the number of children supplied with milk under the milk-in-schools scheme on the latest date for which figures were available.—Mr. ELLIOT replied: At 31st March, 1936, there were 647,662 children in primary schools in Scotland of whom 283,378 were receiving milk under the milk-in-schools scheme. More recent figures of the numbers supplied with milk in primary schools are not yet available, but in September approximately 321,000 children out of a total school population of 807,000 were supplied with milk under the milk-in-schools scheme.

Housing of Aged Persons

Mr. PERKINS asked the Minister of Health whether he would state in percentages the numbers, respectively, of rural district councils, urban district councils, and municipal corporations which had built accommodation specially designed for aged persons since the war.—Sir KINGSLEY WOOD replied: Since the Act of 1930 which permitted small houses suitable for aged persons to rank for subsidy, one bedroomed dwellings have been or are being provided by 13·2 per cent. of the rural district councils, 22·1 per cent. of the urban district councils, and 45·5 per cent. of the municipal corporations. Information is not available with regard to any such dwellings provided under earlier Acts.

MEDICAL NEWS

University of Oxford

In recent examinations for the B.M. the following candidates were successful in the subjects mentioned:—

Forensic Medicine and Public Health.—R. F. B. Bennett, R. G. Blackledge, B. A. M. Brown, D. I. Crowther, H. J. L. Dickinson, T. Gadian, A. C. Grey, N. J. S. Gurney, G. F. C. Hawkins, M. H. Hughes, F. J. Ingham, D. Jefferies, G. O. Jelly, J. Mason, N. J. de V. Mather, C. I. Murphie, R. B. Niven, A. R. Norton, R. G. W. Ollerenshaw, R. E. Ooi, H. G. O. Owen-Smith, G. L. Peskett, I. B. Pirie, J. L. Reid, I. F. Rose, D. A. F. Shaw, T. H. Shire, A. F. Smith, T. B. Snell, R. Y. Taylor, R. H. S. Thompson, C. B. I. Willey, W. Synne Willson, W. B. Young, A. J. M. T. Barnes, and J. M. Sherring.

Materia Medica and Pharmacology.—J. W. Ashley, N. F. E. Burrows, C. D. Cormac, J. M. Couchman, P. S. Edgecombe, O. I. Green, M. W. Hemans, F. J. Ingham, J. N. Macdonald, G. K. McGowan, R. B. Niven, J. C. Prestwich, E. B. G. Reeve, T. R. Savage, J. Scholefield, R. A. Shawyer, T. Sutton Coulson, C. R. B. Welford, K. F. Wilsdon, E. J. Burchardt, D. C. Pedley, and M. M. Pickles.

Pathology.—G. F. Bader, E. H. Hiley, R. M. Hugo, J. G. Jamieson, K. H. A. Marshall, R. B. Niven, T. R. Savage, C. W. Seward, M. A. Slee, B. M. Thornton, C. R. B. Welford, C. B. I. Willey, W. B. Young, and W. E. Young.

An examination for the Radcliffe travelling fellowship, which is of the annual value of £300 and is tenable for two years, will begin on Feb. 16th.

There will be papers in physiology, pathology, and preventive medicine, together with a practical examination in pathology; and an essay subject will also be proposed. Candidates may in addition offer a special branch of medicine or surgery, but notice of this should be given when application is made. They must have passed the examinations required for the B.M. degree not more than four years previously, and they should send their names, addresses, and qualifications to the regius professor of medicine, University Museum, Oxford, not later than Feb. 11th. It is a condition of the fellowship that the holder shall spend at least twelve months outside the United Kingdom.

Leeds University

Mr. Frank Parkinson, head of a firm of electrical engineers and a former student of the University, has given £200,000 for the proposed main frontage to the University in connexion with the reconstruction scheme.

University of London

At an emergency extraordinary meeting of the senate of the University held on Dec. 7th the following resolution was adopted:—

That the Senate desire, both as a body and as individuals, to set on record their sense of the incalculable loss that the University has sustained in the death of Sir Edwin Deller, and to express their profound gratitude for the devoted and single-hearted service he rendered to it. Mourning a great administrator, a wise counsellor, and a beloved friend, they offer their deepest sympathy to his family in their tragic bereavement.

The following additional examiners have been appointed for the degree of M.B., Part I., December, 1936: Mr. R. M. Handfield-Jones and Prof. E. D. Telford (surgery); Mr. Aubrey Goodwin and Prof. F. J. Browne (midwifery).

Applications for the Geoffrey E. Duveen travelling studentship in oto-rhino-laryngology are invited from registered medical practitioners who wish to undertake research on this subject. The fellowship is of the value of £450 a year, and applications should reach the University before Dec. 31st.

The Paul Philip Reitlinger prize, offered this year for the best essay embodying the result of some research work on a medical subject cariedr out by the candidate, has been awarded to Mr. R. A. Gregory, M.Sc., for his essay on the problem of the cyclitols.

The following examiners have been appointed for 1937:—

Diploma in Clinical Pathology.—Prof. E. C. Dodds, Prof. James McIntosh, and Prof. J. Shaw Dunn.

Diploma in Public Health.—Prof. M. E. Delafield, Prof. W. W. C. Topley, F.R.S., Prof. H. B. Maitland, and Prof. H. D. Wright (Part I.); Prof. M. Greenwood, F.R.S., Prof. W. W. Jameson, Prof. R. M. F. Picken, and Dr. Alexander Joe (Part II.). Dr. Joe will also act as examiner for hospital administration and the clinical aspects of infectious disease.

Doncaster Royal Infirmary

Half the annual expenditure of the Doncaster Royal Infirmary has been met by the contributions of workmen and employers in the mining industry.

National University of Ireland

Dr. Denis Coffey has been elected vice-chancellor of the University for 1937 and 1938.

Dr. Henry Moore, professor of medicine in University College, Dublin, was appointed to represent the University as one of the original members of the Irish Medical Research Council.

Prof. Stephen Shea was awarded the degree of M.D. for published work.

University of Dublin

At recent examinations at the School of Physic, Trinity College, the following candidates were successful:—

M.D.

Sydney Brass and R. L. G. Proctor.

M.CH.

Martin Fallon.

FINAL MEDICAL EXAMINATION, PART II.

Medicine.—Isabelle M. V. Elliott, first-class honours; G. C. Blackham, second-class honours; S. H. Morrison, D. J. H. Douglas, J. G. Steinbock, W. J. G. Warwick, P. L. van Aardt, Isidore Shreider, and P. J. Mullaney.

Surgery.—Isabelle M. V. Elliott, first-class honours; H. A. Daniels and S. E. M'Connell, second-class honours; P. G. Patton, G. W. Patterson, N. J. Smith, M. R. W. Spacek, W. E. Counihan, C. W. Greene, T. S. Agnew, Margaret Perry, F. J. C. Loughran, A. E. Fannin, B. G. Kearon, A. E. B. de Courcy Wheeler, J. R. Sides, W. S. M'Bride, and Rebecca M. R. Pike.

Midwifery.—Cecil Mushatt, first-class honours; William Hayes, H. F. Sloan, and E. G. Fox, second-class honours; Sterling Tomlinson, C. W. L. Macnamara, R. W. Duncan, H. M. Carson, and J. C. M'Neilly.

Royal Free Hospital

On Dec. 3rd the annual dinner of this hospital was held at the Savoy Hotel under the chairmanship of Dr. Dorothy Hare. After honouring the loyal toasts the company stood in silence as a tribute to Sir Edwin Deller.

Proposing the health of the School and Hospital, Dr. Hare said that a small isolation block had been added to the hospital during the year, and that plans were being drawn up for a new nurses' home. An anonymous donation of £11,000 had made it possible to establish the "Free Woman's" lectureship in clinical medicine at the hospital medical school of which Dr. Una Ledingham was the first holder. Referring to the training of students, Dr. Hare thought their examination results once more demonstrated the dean's flair for picking winners, as there were many more applicants to join the school than could be accommodated. In describing the early flirtations of the hospital with the school before their permanent union she recalled that the professor of diseases of women was the last to admit women students to his wards yielding to compulsion, but the new generation were what she would term "freeminded." Dr. T. Jenner Hoskin, physician to the hospital, proposed the toast of the Guests and referred by name to Sir Alfred and Lady Webb-Johnson, Sir Walter Schröder, Dr. Elizabeth Courtauld, Mrs. Tate, M.P., and Miss Dorothy Sayers. He mentioned that Miss Sayers had used the hospital as the scene of one of her novels and praised the accuracy of her medical details. In reply Miss Sayers said that the lay population, who were still in a state of savagery, owed much to the medical profession from whom they demanded instant and spectacular cures, usually in the early hours of the morning. She also owed a debt to the profession as a writer of detective novels, but she regretted to say that if the tightening up of the poisons laws went on all villains would in future have to be doctors, as no one but they could get access to the poisons. In thanking the "women's medical G.H.Q." for their hospitality Sir Alfred Webb-Johnson referred to other famous hostesses in history such as Circe, Lady Macbeth, Lucretia Borgia, and Delilah, but seemed in a gay discourse to be under no personal apprehensions. As a member of the court of examiners of the Royal College of Surgeons of England he expressed his pleasure at meeting some of "Mr. Norbury's Young Ladies," while as surgeon to the Middlesex Hospital he recalled with pride that Miss Garrett, in her difficult early struggles, had been allowed to attend certain classes at the Middlesex. That struggle was now over and medical women had had maturity thrust upon them at the sword's point. He wished the school every success in the future and hoped that as it became large it would continue to be great.

Miss D. J. K. Beck proposed the health of the chairman and Miss Hare replied.

Hull Hospital for Women

Dr. Ethel Townend has given £5000 to the Hull Hospital for Women to provide increased accommodation for women of moderate means who wish to be attended by their own doctors.

Royal National Hospital for Rheumatic Diseases, Bath

A meeting will be held at the Vintners' Hall, Upper Thames-street, London, at 4 P.M. on Wednesday, Jan. 27th, to inaugurate an appeal for funds to rebuild this hospital. Sir Edward Grigg will preside and an address will be given by Lord Horder. Of the 1198 patients treated at the hospital last year 209 came from London.

Institute of British Surgical Technicians

On Dec. 3rd Mr. George Lansbury, M.P., presented certificates and prizes at the Chelsea Polytechnic to students who had been successful in the course of studies laid down by the Institute of British Surgical Technicians. Mr. F. J. Harlow, Ph.D., the principal, said it was the first time that a systematic training had been undertaken by the members of the surgical industry, and that the certificates were presented by the Chelsea Polytechnic in conjunction with the institute. Mr. Lansbury said that the fact that the young people in the industry had undertaken systematic study of anatomy and other sciences that were at the base of their work was a very hopeful sign, and he hoped that in the years to come one would not see patients fitted to appliances but appliances fitted to patients.

London Jewish Hospital Medical Society

A successful annual dinner was held by the society on Sunday last, Dec. 6th, when the president of the Society, Dr. Arnold Sorsby, presided over a gathering of nearly four hundred members and their guests. The health of the guest of honour, Lord Snell, chairman of the London County Council, was proposed by the Marquess of Reading, president of the London Jewish Hospital. Dr. E. Miller was responsible for the toast of the guests, for whom Sir John Herbert Parsons, F.R.S., responded. Mr. Coleman Smith proposed the toast of the hospital, to which Mr. J. Cofman-Nicoresti responded. An announcement was made by Dr. Maurice Sorsby that Mr. Smith had donated five thousand pounds to the hospital. Dr. L. H. Savin proposed the toast of the society and its president, to which the chairman responded. The proceedings terminated with a dance.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 28TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1 (Oldham); scarlet fever, 2104; diphtheria, 1471; enteric fever, 18; pneumonia (primary or influenzal), 617; puerperal fever, 35; puerperal pyrexia, 122; cerebro-spinal fever, 11; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 5; dysentery, 26; ophthalmia neonatorum, 75. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 4th was 3132, which included: Scarlet fever, 1136; diphtheria, 994; measles, 13; whooping-cough, 328; puerperal fever, 14 mothers (plus 9 babies); encephalitis lethargica, 288; poliomyelitis, 3. At St. Margaret's Hospital there were 11 babies (plus 2 mothers) with ophthalmia neonatorum.

Deaths.—In 122 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 7 (0) from measles, 7 (0) from scarlet fever, 9 (3) from whooping-cough, 48 (8) from diphtheria, 57 (19) from diarrhœa and enteritis under two years, and 44 (9) from influenza. The figures in parentheses are those for London itself.

Poole reported the only death from enteric fever. Cheltenham had 2 deaths from measles. Fatal cases of diphtheria were reported from 24 great towns: Liverpool 5, Hull and Sheffield each 4.

The number of stillbirths notified during the week was 272 (corresponding to a rate of 46 per 1000 total births), including 37 in London.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Dec. 14th.
United Services. 4.30 P.M. Major H. S. Blackmore: Air-raid Precautions with Special Reference to their Medical Aspects.
TUESDAY.
Meeting of Fellows. 5.30 P.M.
THURSDAY.
Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. J. E. M. Wigley: 1. Erythroplasie of Queyrat. Dr. H. Semon: 2. Bucco-labial Melanosis. Dr. H. W. Barber and Dr. P. M. F. Bishop: 3. Keratoderma Climactericum Treated with Œstrin. Dr. G. W. Bamber: 4. Phlebectasia. Dr. J. H. T. Davies: 5. Senear Usher Type of Pemphigus. Dr. H. W. Barber: 6. Lichen Planus with Bullous Lesions in the Mouth. Demonstration. Dr. J. H. T. Davies: Miniature Wood's Light.
Neurology. 8.15 P.M. Clinical Meeting at the Hospital for Epilepsy and Paralysis, Maida Vale, W.

HUNTERIAN SOCIETY.
MONDAY, Dec. 14th.—8.30 P.M. (Simpson's Restaurant, 2, Bird-in-Hand-court, Cheapside), Mr. A. E. Roche and Dr. D. E. Denny-Brown: Frequency of Micturition in the Adult.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, Dec. 14th.—8.30 P.M., Dr. H. Letheby Tidy, Mr. G. Gordon-Taylor, and Dr. G. de Bec Turtle: Treatment of Hæmatemesis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.
FRIDAY, Dec. 18th.—5 P.M., Dr. Charles Hill and Dr. Maitland Radford: The Future of General Medical Practice.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY, Royal Northern Hospital, Holloway-road, N.
WEDNESDAY, Dec. 16th.—9.15 P.M., Dr. R. R. Traill Chest Disease in Children.

CHELSEA CLINICAL SOCIETY.
TUESDAY, Dec. 15th.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Mr. Nigel Parsons: Brewing and Bacteria.

EUGENICS SOCIETY.
TUESDAY, Dec. 15th.—5.15 P.M. (Rooms of the Linnean Society, Burlington House, Piccadilly, W.), Wing-Commander A. W. H. James, Dr. Caroline Maule, and Mr. J. Verney Quilliam: Voluntary Sterilisation—the Work of the Past Year.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

ROYAL INSTITUTION, 21, Albemarle-street, W.
TUESDAY, Dec. 15th.—5.15 P.M., Prof. E. Mellanby, F.R.S.: Chemical Messengers of the Body.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY, Dec. 14th.—2.30 P.M., Dr. R. D. Lawrence: Diabetes and Diseases of Pancreas.
TUESDAY.—2 P.M., Mr. King, Ph.D.; pathological demonstration.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).
THURSDAY.—2.30 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Prof. J. M. Munro Kerr: Disproportion and Difficult Labour.
FRIDAY.—2 P.M., operative obstetrics. 2.30 P.M., Prof. Seymour Barling: Acute Surgical Infections other than Bone. 3 P.M., department of gynæcology, pathological demonstration.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics or operations, obstetrical and gynæcological clinics or operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Dec. 14th.—10 A.M., skin clinic. 11 A.M., surgical wards. 2 P.M., operations, surgical, and gynæcological wards, medical, surgical, and gynæcological clinics.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., operations, medical, surgical, and throat clinics.
WEDNESDAY.—10 A.M., children's ward and clinic. 11 A.M., medical wards. 2 P.M., gynæcological operations, medical, surgical, and eye clinics.
THURSDAY.—10 A.M., neurological and gynæcological clinics. Noon, fracture clinic. 2 P.M., operations, medical, surgical, genito-urinary, and eye clinics. 4.15 P.M., venereal diseases.
FRIDAY.—10 A.M., medical wards, skin clinic. Noon, lecture on treatment. 2 P.M., operations, medical, surgical, and throat clinics.
SATURDAY.—10 A.M., children's and surgical clinics. 11 A.M., medical wards.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, Dec. 14th, to SATURDAY, Dec. 19th.—LONDON LOCK HOSPITAL, 91, Dean-street, W., afternoon course in venereal diseases (open to non-members).—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E., afternoon course in dermatology.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W., Wed., 8.30 P.M., Dr. S. Levy Simpson: Adrenal.—BROMPTON HOSPITAL, S.W., M.R.C.P. course in chest diseases (twice weekly, at 5 P.M.).—CITY OF LONDON HOSPITAL, Victoria Park, E., Wed. and Fri., 6 P.M., M.R.C.P. course in heart and lung diseases.—WEST END HOSPITAL FOR NERVOUS DISEASES, Gloucester Gate, N.W., afternoon M.R.C.P. course in neurology.—These courses are open only to members of the fellowship.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
WEDNESDAY, Dec. 16th.—2 P.M., Dr. E. A. Cockayne: Pink Disease. 3 P.M., Mr. James Crooks: Development and Diseases of the Accessory Air Sinuses.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, Dec. 16th.—4 P.M., Mr. A. Clifford Morson: Hæmaturia.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Dec. 18th.—4 P.M., Mr. F. R. Watkyn-Thomas: Vertigo.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY, Dec. 18th.—4.30 P.M., Mr. Harold Barwell: The Ear, Nose, and Throat in Relation to the Rheumatic Diseases.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Dec. 15th.—4.15 P.M., Prof. Daniel Dougal: Acute Salpingitis.
FRIDAY.—4.15 P.M., Mr. Geoffrey Jefferson: Demonstration of Neuro-surgical Cases.

MANCHESTER HOSPITAL FOR CONSUMPTION, Deansgate.
WEDNESDAY, Dec. 16th.—4.30 P.M., Mr. R. H. Smith: Clinical Course and Diagnosis of Acute Mastoiditis.

LEEDS GENERAL INFIRMARY.
TUESDAY, Dec. 15th.—3.30 P.M., Dr. J. T. Ingram: Demonstration of Dermatological Cases, with Reference to General Principles in Treatment.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Dec. 16th.—4.15 P.M. (Royal Maternity and Women's Hospital), Prof. James Hendry: Delayed Labour.

Births, Marriages, and Deaths

BIRTHS

BRACKEN.—On Nov. 23rd, at Blackheath, the wife of Dr. J. P. Bracken, of a daughter.
CAMERON.—On Nov. 30th, at Maidstone, Kent, the wife of Mr. Dugald Cameron, F.R.C.S., of a son.
COLLEY.—On Nov. 22nd, the wife of Dr. R. Colley, of Bath, of a son.
EARLY.—On Nov. 28th, at Shillong, Assam, the wife of Capt. E. P. N. M. Early, I.M.S., of a son.
JOLL.—On Dec. 6th, at Harley-street, W., the wife of Mr. Cecil Joll, F.R.C.S., of a son.
MORRIS.—On Dec. 2nd, at Welbeck-street, W., the wife of Dr. C. W. Morris, of Elsworthy-road, N.W., of a daughter.
OLIVER.—On Nov. 30th, at St. Peter's, Jersey, the wife of Dr. Gordon Oliver, of a son.
ROSE.—On Nov. 26th, at Bombay, the wife of Major G. W. Rose, R.A.M.C., of a son.
SCOTT.—On Nov. 30th, the wife of Mr. T. G. Scott, F.R.C.S., Speen, Newbury, of a son.
SPERO.—On Nov. 25th, at Blackheath, the wife of Surg. Lt.-Comdr. L. P. Spero, R.N., of a daughter.

MARRIAGES

GRAY—GANNAWAY.—On Dec. 8th, 1936, at St. James's Church, Spanish-place, Edward Emile Delisle Gray, M.D., M.R.C.P., son of the late Dr. and Mrs. St. George Gray, to Lilian Maud, daughter of Charles Henry Gannaway, and the late Mrs. Gannaway.
HADFIELD—MACDOUGALL OF MACDOUGALL.—On Dec. 2nd in St. John's Cathedral, Oban, Stephen John Hadfield, M.B. Camb., to Jean Louisa Morag, second daughter of Col. MacDougall of MacDougall, of Oban.
MADDOCK-JONES—JOINER.—On Dec. 7th, at Leyton, Essex, A. Maddock-Jones, M.R.C.S., to Kathleen Jean, daughter of the late Mr. and Mrs. Gordon W. Joiner, of Leyton.

DEATHS

BOURKE.—On Dec. 7th, in London, Major-General Sir George Deane Bourke, K.C.M.G., C.B., R.A.M.C. (retired), aged 84.
CASH.—On Nov. 30th, at Hereford, John Theodore Cash, M.D. Edin., LL.D., F.R.S., aged 82 years.
CHRISTIE.—On Dec. 2nd, at Edinburgh, Dugald Christie, C.M.G., F.R.C.P., F.R.C.S. Edin., Missionary of the Church of Scotland in Manchuria, in his 82nd year.
GREENWOOD.—On Friday, Dec. 4th, at Allington, Maidstone, Alfred Greenwood, M.D., B.Sc., D.P.H., Barrister at Law, Medical Officer of Health for the County of Kent, aged 63.
IONIDES.—On Dec. 2nd, at Hove, Theodore Henry Ionides, M.B. Lond., F.R.C.S. Eng., aged nearly 71.
MACFEE.—On Dec. 5th, at Hampstead, London, John Macfee, M.D. Glasg., aged 92.
STRATTON.—On Nov. 30th, in a road accident, James Ernest Stratton, M.D. Lond., of Rotherhithe, aged 60.
THOMASON.—On Dec. 1st, Henry Philip Thomason, M.B. Birm., of Fillongley, near Coventry, in his 57th year.
WALLIS.—On Nov. 30th, at Bromley, Kent, Sidney Seymour Wallis, M.R.C.S. Eng., aged 68.
WHITWELL.—On Dec. 1st, Alfred Frank Whitwell, M.R.C.S. Eng., of Shrewsbury, aged 81.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE DOCTOR'S MANDATE IN PARLIAMENT

AN ADDRESS BY SIR F. FREMANTLE, M.D., M.P.*

Sir James Crichton-Browne introduced Sir Francis Fremantle in happy phraseology, expressing his belief that the knowledge existed in Europe and throughout the world that our own country, in spite of its failings, had, as compared with other countries, a healthier and a stronger population.

Sir Francis Fremantle commenced his address by a biographical enumeration of the doctors of medicine who have sat in Parliament—a considerable number, seeing that 84 medical Members of Parliament were recorded in an interesting medical parliament roll, compiled by Dr. Samuel Clippingdale, and published in the *British Medical Journal* in 1910. Sir Francis told of the distinguished part in affairs played by such doctors, to select some from his list, as Samuel Turner, who fought on the King's side in the Civil War; William Petty, professor of anatomy at Oxford and of music in Gresham College, London, and physician to Charles II; Nicholas Barbour, to whom the origin of fire insurance companies is attributed; John Radcliffe, the founder of the Radcliffe Infirmary, Library, and Observatory at Oxford; Baron Dimsdale, who inoculated the Empress Catharine and the Russian Court against small-pox; and Thomas Wakley, first editor of THE LANCET, and his vigorous ally, Joseph Hume, economist. Coming to more modern times, he mentioned, among many others, John Batty Tuke, Balthazar Walter Foster (Parliamentary Secretary to the Local Government Board, and later created Lord Ilkeston), Sir William Collins, and Lord Moynihan. Sir William Collins he noted as being fortunately still with us, and chairman of the Chadwick Trustees. Among contemporary doctors in either House, doing valuable service, he enumerated Lord Dawson of Penn, Lord Horder, Dr. Elliot, Sir Henry Jackson, and Dr. Addison.

After a brief summary of the opportunities which a spreading interest in public health had given to the doctor in Parliament in the period just preceding the war, he described the developments which had followed the creation of the Ministry of Health. He said:

PARLIAMENTARY ACTIVITY

"Our post-war health legislation has developed the whole machinery of public health to a remarkable extent, throwing the burden and responsibility of its administration on local authorities, with generous expert and financial assistance from the Government. If we look through the measures that have been passed since the war and that concern more directly the health of the people, we are struck with the variety and extent of them. In the year 1919 there were passed at least five most important measures. The first was that which created the Ministry of Health, the second was the Nurses Registration Bill, which made the nursing profession into a recognised and ordered whole; and then there were the two great Housing Bills of Dr. Addison and a very important Rent and Mortgage Interest Restriction Act. In the year 1920 we had a Census Act which put the Census on a permanent footing, to be taken automatically every ten or possibly every five years, as decreed by Order of Council. There was a Dangerous Drugs Act, and there were National Health Insurance, Unemployment Insurance, and War Pensions Amending Measures. In 1921 we had the Dentists Act, which did for the dental profession what the Nurses Registration Act had done for the nursing profession. We had a further Housing Measure, a Public Health Officers' Measure, and a Tuberculosis Measure, an Unemployment Insurance Measure to increase the benefits, and a War Pensions Amending Measure. In 1922 we amended the Allotments Acts and we amalgamated and amended the Unemployment Insurance Acts. In 1923 we amended the Dangerous Drugs and Poisons Act. Mr. Neville Chamberlain introduced and secured the passing of his great Housing Bill, with a large subsidy for housing, both for local authorities and for private enterprise, and we amended the Rent and Mortgage Interest Restriction Act and the Workmen's Compensation Act.

In 1924 we had a further Housing Bill, with Mr. Wheatley's subsidy for housing under the local authorities. In 1925 we had further measures dealing with allotments and dangerous drugs, an important measure with regard to the guardianship of infants, further measures as regards housing, a very important measure for rating and valuation, a measure as regards merchant shipping, introducing the International Labour Conventions, a measure to amend the Public Health Act, and a Teachers (Superannuation) Measure, going to the root of the welfare of the teachers, enhancing the credit of the teaching profession and therefore indirectly the standard of education of the country. We also had a measure consolidating the Town Planning Acts, and a very vital measure, Mr. Chamberlain's Widows', Orphans', and Old Age Contributory Pensions Act. In 1926 we had a measure for the adoption of children, a Coroners (Amendment) Act, a Births and Deaths Registration Measure, and a minor but important Housing (Rural Workers) Measure; the Small Holdings and Allotments Act was amended, and we passed a Bill for the inspection and registration of midwives and maternity homes and a measure with regard to the sale of food (weights and measures). In the year 1927 we amended the Mental Deficiency Act, we enlarged the previous measure with regard to maternity homes by a Nursing Homes Registration Act, we consolidated the Poor Law, and we dealt with other amending measures. In 1928 we consolidated the Foods and Drugs (Adulteration) Acts, we amended the National Health Insurance Act, and we dealt further with rating and valuation, as a preliminary to local government reform. In 1929 Mr. Chamberlain passed his vast Local Government Bill, to amend, to extend, and to grant relief of various kinds, with a corresponding measure for Scotland. In 1930 we had the second Labour Government, and we passed a Housing Measure, largely a non-party measure, to do away with the slums. We had an important Mental Treatment Act, a Poor Law (Consolidation) Act, and certain measures to amend Acts already mentioned.

RECENT LEGISLATION

In 1931 the National Government, despite their preoccupation with urgent matters in connexion with the financial crisis, were still able to pass another Housing (Rural Authorities) Measure, three Unemployment Insurance Acts of one kind or another, and the Yarmouth Naval Hospital (for Lunatics and Mental Defectives) Act. In 1932 we had a Children and Young Persons Measure of great importance. We had further measures to deal with dangerous drugs, national health insurance, and planning, and a Merchant Shipping Bill to deal with the Safety and Load Line Convention. In 1933 we consolidated Children and Young Persons Measures; we had a further important Housing Measure, to end the subsidies under the 1923 and 1924 Acts and therefore to leave only the subsidies under the Slums Measure of 1930; we had a Pharmacy and Poisons Measure, a further and very important

* A Chadwick public lecture delivered at the Great Hall, B.M.A., on Nov. 24th, 1936.

Rent and Mortgage Interest Restrictions Act, and a measure for the humane slaughter of animals. In the year 1934 we had a further amendment of the unemployment provisions, we had an important Water Supplies Measure to deal with the exceptional shortage, and we had a Workmen's Compensation (Coal Mines) Measure. In 1935 we had the great Housing Bill to deal with overcrowding and complete the general structure to deal with the housing problem. We had the Restriction of Ribbon Development Act, and we had a great measure for consolidating the Unemployment Insurance Acts. This year we have dealt with the Hours of Employment Conventions with regard to women, and we have consolidated the Old Age Pensions Acts, the National Health Insurance Acts and Widows', Orphans', and Old Age Contributory Pensions Acts. We brought in and passed the first of a great series of measures to consolidate the Public Health Acts, which takes 228 pages, and a corresponding London Act that takes 251 pages, and a consolidation of the Housing Acts which takes 173 pages, so you can understand that they gave lawyers plenty of occupation, and, no doubt, plenty of remuneration. We have also had a Shops (Sunday Trading Restriction) Act, and an Act dealing with midwives. Such is the actual record of the tasks with which we have had to deal up to date this year.

HEARTENING FIGURES

"The law has been largely simplified by consolidation. The members of the auxiliary professions, nurses, midwives, dentists, architects, and health visitors, have been recognised and helped. Probably the greatest measure of all was the Local Government Act of 1929, with its block grant, the conversion of the Poor Law into Public Assistance under county councils and county borough councils, and the systematic rearrangement of local administration. The effects of this work are at least reflected in the records of the twenty-five years of His late Majesty's reign, and I should like to bring to your notice some of the figures which show how far we have travelled during that quarter of a century. I will give you the figures in numbers rather than percentages, because, to my mind, they are always more impressive. Taking the number of deaths on an average during the ten years preceding King George V's accession to the throne and comparing it with the last year of his life, we find that the deaths from diphtheria diminished from 6092 to just over 4000, deaths from diarrhœa and enteritis diminished from 18,000 to under 5000, deaths from enteric fevers diminished from 3000 to 159, deaths from measles diminished from 10,500 to under 4000, deaths from scarlet fever diminished from 3600 to 960, deaths from small-pox diminished from 429 to only 6, deaths from tubercle (respiratory) diminished from nearly 40,000 to 26,000, deaths from other forms of tubercle diminished from just under 17,000 to 5000, and deaths from whooping-cough diminished from 9500 to 2000. Besides the marked decline or elimination of these diseases, the death-rate fell by nearly 4 per thousand and the infant mortality-rate by 71 per thousand, and in this one-quarter of a century the expectation of life increased by some seven years."

THE MEDICAL MEMBER

Sir Francis then sketched the work which the Medical Committee had done, mentioning its activities in association with the General Medical Council, the League of Nations' health organisation, the Royal Society of Medicine, the British Medical Association, and the Medical Research Council. The committee had taken up, he pointed out, such varying subjects as an Opticians' Bill, fatal administrations of anæsthetics, various aspects of the Factory Bill, and questions relating to coroners, dentists, anatomists, pharmacists, midwives, and the sterilisation of the unfit, "a remarkable hotchpotch showing the widespread interest of our work," and gave his reasons for thinking that on general policy and administration, a medical Member of Parliament is not, as yet, sufficiently recognised, in spite of unique opportunities for acquiring knowledge of the conditions of the people and of their mentality.

"The medical man, he said, takes Party at its worth, essential for practical purposes but reflecting only tendencies, between which he would naturally preserve the middle path of a liberal conservatism, with a full use of State machinery and resources on the one hand and encouragement of private enterprise and initiative on the other. He sees the limitations of any policy and in his mind has achieved a synthesis which is best expressed by an all-party Government; but he knows that such a placid system, without effective opposition, must in the end make for stagnation, and so he throws in his lot and influence on one side or the other of the central line. If he aims at high office he must avoid much occupation at first with health matters, or he will be 'damned as an expert.' By such avoidance he gains experience and credit, and may so, in the end, be of the greatest service to the State, even in health matters, as one hopes the new Secretary of State for Scotland will be. But in the rank and file there is much for the doctor to do with his mandate. Let me take one point, which is constantly impressing itself on one's mind: the frequent reference to research. Usually the word 'research' is used loosely, without much understanding of its meaning, for any kind of reference to books and delay in action. Sometimes it is real research, but as often as not it is only a boiling-up of what other people have said. The medical man knows the difference between genuine research and such sham collation of facts, which often goes under the name of research. It is his duty to carry on research in the political sphere and to help others to carry it on, in order to get down to the bedrock of facts and their causation, and, while full of enterprise and imagination, as a research worker must be, he should keep steadily, as is necessary in the political sphere, to the end to be aimed at. While averse from in any way trimming the facts to the end at which he is aiming, he should at the same time refrain from dissipating his energies or those for which he is responsible in useless and frittering researches that are not of real value for the ends of policy and activity. That is one of the most difficult tasks, and one in which the medical man has a particularly strong conscience, which he should exercise.

"On the medical man falls the privilege of dealing fearlessly, in private and in public, with the awkward topics—sexual questions and marriage, betting, licensing, Sunday trading, and moral and ecclesiastical problems—subjects instinct with pride, principle and, in the proper sense of the word, with prejudice. He, almost alone in Parliament, has no right to shirk the difficulties of birth control and other national dangers. He, more especially, can see disease in the body politic at an early stage and prescribe for its elimination. His whole desire and influence must be for peace. His voice should be heard and his part should be of special value in deciding root policy affecting peace and war, strikes and conciliation, as indeed any other matter—finance, education, the fine arts—if he will take the trouble to study them and their background. He stands, above all, for the proper blending of material and spiritual values, with the spirit, its encouragement and satisfaction, as the dominant note and object of the doctor's mandate in Parliament."

A debate followed in which such questions as legislation on patent medicines, on the notification of vermin, and the housing situation, especially in London, and other important topics were discussed, which gave Sir Francis an opportunity of explaining the machinery by which private Bills could be introduced.

The meeting closed with cordial votes of thanks to the lecturer and the chairman.

L.C.C. AND UNEMPLOYED MARCHERS

REPORT was made on Tuesday to the London County Council on the arrangements made for the various groups of marchers expected in London at the beginning of last month. Technically they are regarded as wayfarers, and if destitute of accommodation they are subject to the public assistance authority, but in this case the consent of the Minister of Health was obtained to mitigate the usual order in regard to searching, detention, and tasks of work. The total number of men was 1713, of whom 141 were blind. They were housed in seven non-residential training centres in which the workshops were dismantled and cooking facilities revised. Various metropolitan borough councils agreed to parties visiting the public baths and underclothes were washed at institution laundries. A medical officer attended at each centre with medicines and dressings and a supervising officer slept there. All the dormitories were heated; the men slept on the floor, three blankets and if required a nightshirt being issued to each. The usual casual ward diet was provided with liberty to supplement from outside sources. No individual tasks of work were required, but the marchers (the blind contingent excepted) were called upon to clean their quarters, the dining-rooms, lavatories, and staircases. The total cost for the 1713 men was estimated at £1080.

HERALDIC AND OTHER EMBLEMS

To the Editor of THE LANCET

SIR,—May I appeal through your columns to those who have charge of the stationery, official documents, and invitation cards issued by the important institutions and departments throughout the country to give more attention to the artistic merits of the heraldic emblems which they issue. For many years I have collected some thousands of these devices and to me it is quite evident that many of those issued to-day do not bear the crucial test of magnification. As specimens of alleged artistic printing (remembering the praise bestowed thereon: "First of arts, without thy light, all other arts would sink in night") many are atrocious, especially the gaudy coloured devices. The black and white devices on the other hand are more frequently worth close attention and magnification. For example, the device of the Chelsea Clinical Society (I know nothing of its origin), although simple black and white, is excellent. Not all of us are philatelists; personally I have found a little pleasure for years in examining heraldic emblems.

I am, Sir, yours faithfully,

London, Dec. 4th. BLANCUS.

THE C.S.M.M.G. DIRECTORY

THERE comes a time when a professional directory becomes set in its ways, having learnt by experience what its customers want. The register of members of the Chartered Society of Massage and Medical Gymnastics had not quite reached that stage, for the 1936 edition has made a change which turns the register into a directory. Hitherto the annual issue has contained only the names, addresses, and qualifications granted by the Society. In the present issue each member of the Society has been given the opportunity to include at will additional information under four headings: (1) qualifications other than those of the C.S.M.M.G., (2) special treatments undertaken, (3) appointments held, (4) name of training school. The directory now approaches closely to the form of the Medical Directory and will doubtless be found more serviceable for purposes of reference. Separate from the directory of members in practice is an alphabetical list of members not practising or whose addresses cannot be verified. The directory can be obtained from the offices of the Society, Tavistock House (North), Tavistock-square, London, W.C.1, price 4*s*.

NEW PREPARATIONS

"SULPHONAMIDE-P" (*p*-AMINOBENZENESULPHONAMIDE).—The British Drug Houses Ltd., inform us that they have been making this substance experimentally for some time past, and have developed a process for its manufacture, in a state of purity, on an industrial scale. During the experimental stages attention was paid particularly to its production in a pure state, and a paper on this aspect of the subject, by a member of the staff of the B.D.H. analytical laboratory, has lately appeared in the *Quarterly Journal of Pharmacy and Pharmacology* (1936, ix., 560). The purified substance is issued in the form of tablets, each of 0·5 gramme, for use in the treatment of streptococcal infections such as puerperal septicæmia and erysipelas. These tablets, which are available in bottles of 25 and 100, are administered orally, and the dosage recommended is up to 3 g. (six tablets daily) for average cases; but for more serious cases, where intensive treatment is necessary, as much as 5 g. daily may, it is stated, be given with perfect safety. Members of the medical profession wishing to make trial of these tablets of Sulphonamide-P will be supplied with the necessary material free of charge on application to British Drug Houses Ltd., Graham-street, City-road, London, N.1.

VEGEMUCIN is a mixture of vegetable mucins recommended to counteract acidity in the stomach. The action of the mucins is purely physical: they adsorb hydrochloric acid, and, it is said, form a protective film over the gastric mucous membrane, before being excreted unchanged in the fæces. Their advantage over alkalis is that they do not, like sodium bicarbonate, induce further secretion of acid, and it is suggested that Vegemucin should be used, in varying quantities, in cases of heartburn, hyperacidity, and peptic ulcer. The preparation is a coarse powder flavoured with chocolate and is given in doses of ¼–1 teaspoonful two or three times daily or oftener. The makers are H. R. Napp, Ltd., 3, Clements Inn, W.C.2.

PANOPSIN, prepared from pancreatic enzymes, is put forward as an aid to digestion, especially where there are signs that this is incomplete and corresponding symptoms of dyspepsia. The amylopsin it contains is described as the strongest starch-splitting enzyme known, being six times more active than the aspergillus fungus product, and its action on foodstuffs is assisted by trypsin and lipase. The manufacturers, Endocrines-Spicer, Ltd. (Watford, Herts), advise that their Panopsin tablets should be taken just before meals.

In HEPFEROL a liver extract is associated with iron in readily assimilable ("neutral colloidal") form. It is prepared by A/s Serpens, of Copenhagen, and is recommended for "all cases of pernicious anæmia and in all anæmic conditions which do not respond sufficiently to iron therapy alone." It consists of granules with a pleasant flavour, and it does not stain the teeth. The English distributors are Coates & Cooper, Ltd., 94, Clerkenwell-road, E.C.1.

The Glaxo Laboratories Ltd. (Greenford, Middlesex) announce that they have reduced the price of Farex, their "reinforced" cereal food for infants, children, adults, and invalids. It is stated to contain substantial quantities of calcium and iron, 1900 international units of vitamin A per oz., 625 of vitamin D per oz., and vitamins B_1 and B_2.

THE LONDON FEVER HOSPITAL

Mr. W. ELLIOT DIXON (secretary, London Fever Hospital) writes: Information in regard to the accommodation available at this hospital was recently circulated to members of the medical profession in the London area. There have, as a result, been so many inquiries in regard to private rooms that we shall be most grateful if you will allow us space in

your columns to make it known that the fees for such accommodation here are from seven to ten guineas a week inclusive.

CHRISTMAS SEALS.—For the fourth year in succession a sale of Christmas seals has been arranged under the auspices of the National Association of the Prevention of Tuberculosis to provide tuberculosis care committees with funds. A very determined-looking Father Christmas is striding across the seal this year, and we hope that many of our readers will allow him "right of way" on their Christmas parcels and letters. If they wish they may obtain the seals from the secretary of the Christmas Seal Sale, Tavistock House, Tavistock-square, London, W.C.1, at ½d. each or 4s. for a hundred.

Appointments

BYRNE, E. A. J., M.D. Belf., has been appointed Senior Resident Medical Officer at the Birkenhead Municipal Hospital.

DOLLAR, JEAN, M.S. Lond., F.R.C.S. Eng., D.O.M.S., Part-time Ophthalmic Surgeon for Middlesex.

EDWARDS, A. TUDOR, M.D., M.Ch. Camb., F.R.C.S. Eng., Surgeon in Charge of the Department of Thoracic Surgery at the London Hospital.

ESHER, F. J. S., M.B. Birm., D.P.M., Medical Superintendent of the proposed Sheffield Mental Deficiency Colony.

LING, T. M., B.M. Oxon., M.R.C.P. Lond., Police Surgeon to the Bristol Constabulary.

VAIZEY, J. M., M.D., M.R.C.P. Lond., Medical First Assistant and Registrar to the London Hospital.

London County Council Hospital Staff.—The following appointments and transfer are announced. A.M.O. (II.) = Assistant Medical Officer Grade II. Temp. D.M.O. = Temporary District Medical Officer.

HOGARTH, J. C., M.B. Glasg., A.M.O. (II.), Eastern;
CANN, A. M. R., M.B. Lond., A.M.O. (II.), South-Western;
SAVAGE, O. A., M.R.C.S. Eng., A.M.O. (II.), Grove;
BIRRELL, N. V., M.B. Glasg., D.P.H., A.M.O. (II.), South-Eastern;
HUDSON, E. H., M.B., M.R.C.P. Lond., Visiting Medical Officer, St. George's Home;
CLIFT, A. F., M.R.C.S. Eng., M.C.O.G., Part-time A.M.O., Mat. Dept., St. Olave's;
LINDSAY, D. M., M.D. Glasg., M.C.O.G., Part-time A.M.O., Mat. Dept., St. Leonard's;
ALABASTER, G. H., M.D. Birm., F.R.C.S. Edin., M.C.O.G., Part-time A.M.O., Mat. Dept., Hackney;
KAINES-LEE, GWENDOLEN E., M.B. Melb., Part-time A.M.O., Mat. Dept., St. Mary, Islington;
TILBURY, ROBERT, M.R.C.S. Eng., Temp. D.M.O., New Cross;
RUBEN, HARRY, M.B. Dub., Temp. D.M.O., Bellingham and Downham;
EBAN, ISAAC, M.B. Belf., D.M.R.E., Temp. D.M.O., Lambeth;
FENTON, M. J., M.B. Sheff., Temp. D.M.O., Lambeth;
MCFADYEAN, KENNETH, M.R.C.S. Eng., Temp. D.M.O., Lambeth;
HOUGHTON, L. E., M.D. Camb., Medical Superintendent, Colindale;
MUIR, CLEMENT, M.B., M.R.C.P. Edin., Senior A.M.O. (II.), North-Western;
GRANT, ALAN, M.B. Aberd., A.M.O. (II.), Park.

Certifying Surgeons under the Factory and Workshop Acts: Dr. J. DONOVAN (Crewe District, Cheshire); Dr. J. D. ROBERTSON (Highworth District, Wilts).

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Hospital for Sick Children.—Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.
Aberdeen University.—Lecturer in Department of Medicine, £400–£575.
Acton Hosp., W.—Cas. O., at rate of £150.
Ashton-under-Lyne District Infirmary.—H.S., at rate of £150.
Bedford County Hospital.—First H.S., at rate of £155.
Bedfordshire County Council.—Asst. County M.O.H., &c., £800.
Birmingham City.—Asst. M.O.H., £600.
Birmingham, Erdington House.—Asst. Res. M.O., £300.
Bolton Royal Infirmary.—H.P. and two H.S.'s, at rate of £200 and £150 respectively.
Brighton, Lady Chichester Hosp., Hove.—Sen. and Jun. H.P., at rate of £100 and £50 respectively.
Brighton Municipal Hospital.—Third Res. Asst. M.O., £300.
Bristol General Hospital.—Two H.P.'s, three H.S.'s, Res. Obstet. O., H.S. to Spec. Depts., each at rate of £80. Also Cas. H.S., at rate of £100.
Bristol, Southmead Municipal General Hosp.—Jun. Asst. Res. M.O., at rate of £200.
Bristol University, Preventive Medicine Dept.—Laboratories Asst. Clin. Pathologist, £375.
Buxton, Derbyshire, Devonshire Royal Hosp.—H.P., at rate of £150.
Cambridge, Addenbrooke's Hospital.—H.P., at rate of £130.
Cardiff, Welsh National School of Medicine.—Part-time Lecturer in Anæsthetics at rate of £525.
Chichester, Royal West Sussex Hosp.—Sen. H.S., £175.
Colchester, Essex, County Hosp.—H.S., £175.
Doncaster Royal Infirmary and Dispensary.—Res. Anæsthetist, at rate of £175.
Glasgow University.—Gardiner Lectureship in Pathology of Diseases of Infancy and Childhood.
Gloucestershire Royal Infirmary.—Hon. Anæsthetists. Also H.S., at rate of £150.
Hertford, County Hosp.—H.P., at rate of £150. Also Hon. Asst. Anæsthetist.
Hospital for Tropical Diseases, Gordon-street, W.C.—H.P., at rate of £120.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P., at rate of £100.
Leicester, City Mental Hosp., Humberstone.—Locum Tenens A.M.O., 10 gns. weekly.
Leeds University, Faculty of Medicine.—Second Surg. Tutor £400.
Liverpool Dispensaries.—Res. M.O., £300.
Liverpool, Hahnemann Hospital, Hope-street.—Res. M.O., at rate of £120.
London County Council.—Two Radiologists, each £900. Part-time Radiologists, at rate of £125. Also Temporary Visiting M.O., £200.
London Hosp., E.—Surg. First Asst. and Reg., £300.
London University.—University Chair of Pathology, £2000.
Manchester, Ancoats Hospital.—Combined H.S. (Aural) and H.P., at rate of £100.
Manchester, Christie Hosp. and Holt Radium Institute.—Res. M.O., at rate of £150.
Manchester Ear Hospital, Grosvenor-square, All Saints'.—Visiting Anæsthetist.
Manchester Hosp. for Consumption and Diseases of the Throat and Chest.—Res. M.O. for Ear, Nose, and Throat Dept. £200.
Manchester, Park Hosp., Davyhulme.—Res. Obstet. Officer, £400.
Manchester, Royal Children's Hosp.—Res. M.O. and Res. H.S., at rate of £150 and £100 respectively.
Manchester, Withington Hospital.—Sen. Cons. Obstet. and Gynæcologist, at rate of £400.
Marie Curie Hosp., 2, Fitzjohn's-avenue, N.W.—Res. M.O., £100.
Metropolitan Hospital, Kingsland-road, E.—Asst. M.O. to Physiotherapeutic Dept.
National Temperance Hospital, Hampstead-road, N.W.—Cas. O. and H.S., at rate of £120 and £100 respectively.
Newcastle General Hosp.—H.S. and H.P., each at rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. H.P.'s and H.S.'s to Special Depts., each at rate of £50. Two Anæsthetists, each at rate of £200, Two H.P.'s for Leazes Hospital, each at rate of £100. Also Assistant to National Radium Centre, £250.
Newport, Royal Gwent Hosp.—H.S. to Fracture and Orthopædic Dept., at rate of £135.
North Riding of Yorkshire C.C.—Asst. Tuber. M.O., £600.
Oldham, Boundary Park Municipal Hosp.—Res. Asst. M.O., at rate of £200.
Pontefract General Infirmary.—Res. M.O., at rate of £150.
Prince of Wales's General Hosp., N.—Jun. H.S., £90.
Prison Service.—M.O. Class II., £525.
Reading, Royal Berkshire Hosp.—Bio-Chemist, £400. Also two H.S.'s, each at rate of £125.
Rochdale, Birch Hill Hospital.—Jun. Res. M.O., at rate of £225.
Rochester, St. Bartholomew's Hosp.—H.P., at rate of £150.
Royal Cancer Hospital, Fulham-road, S.W.—Sec. Asst. Pathologist, £250.
Royal Masonic Hospital, Ravenscourt Park, W.—Res. Surg. O., at rate of £250.
Royal Northern Hosp., Holloway, N.—H.S., at rate of £70.
Salford City.—Asst. Clin. Tuber. O., £500.
St. Leonard's-on-Sea, Buchanan Hosp.—Jun. H.S., £125.
St. Paul's Hosp. for Urological and Skin Diseases, Endell-street, W.C.—H.S., at rate of £100.
St. Thomas's Hosp., Medical Unit, S.E.—First Asst., £500–£600.
St. Thomas's Hospital, S.E.—Chief Asst. to Children's Dept.
Sheffield Royal Hosp.—Vacancy on Res. Med. Staff, at rate of £80.
Southampton County Borough.—Clin. V.D.O., Pathologist, and Asst. M.O.H., £750.
Southampton, Royal South Hants and Southampton Hosp.—Hon. Clin. Asst. to Dermatological Dept.
South-Eastern Hospital for Children, Sydenham, S.E.—Res. M.O., at rate of £100.
Southend-on-Sea General Hosp.—Res. Obstet. Officer, at rate of £100.
South London Hosp. for Women, Clapham, S.W.—Asst. Gynæcological Surgeon. Also Clin. Asst. for Gynæcological Out-patients.
Stoke-on-Trent, Longton Hosp.—H.S., £160.
Sunderland Children's Hosp.—H.S., £120.
Swansea County Borough.—Asst. M.O., £500.
Tewkesbury Borough, &c.—M.O.H., £800.
West Bromwich, Hallam Hosp.—H.P., at rate of £200.
Willesden General Hospital, Harlesden-road, N.W.—Hon. Ophth. Surgeon. Hon. Clin. Assts. to Out-patients' Dept. Also Cas. O., at rate of £100.
Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.S., at rate of £100.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Glasgow, West, Llangollen (Denbigh), and Brigstock (Northampton).